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THE APPLICABILITY OF PHONIC GENERALIZATIONS TO SELECTED SPELLING PROGRAMS

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THE APPLICABILITY OF PHONIC GENERALIZATIONS

TO SELECTED SPELLING PROGRAMS

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DEDICATION

This research study is dedicated to my nieces and nephews, Toni, Renee, Glenn, and Arthur, and to my god-children, Carlton and John, Jr. May they be inspired in their educational endeavors.

ACKNOWLEDGMENTS

Sincere thanks are expressed to Dr. Mary Clare Petty, chairman of the doctoral committee and director of the research study. Without her guidance and constructive criticisms the study could not have been undertaken or completed.

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Appreciation is expressed to Dr. Theodore Clymer, Dr. Mildred Hart Bailey, Follett Publishing Company, Ginn and Company, J. B. Lippincott Company, Silver Burdett Company, The Economy Company, and The L. W. Singer Company for permission to utilize selected materials from their published articles and textbooks. Appreciation is also expressed to the International Reading Association for permission to quote from materials published in The Reading Teacher.

Special thanks are expressed to the administration and to my colleagues at Florida Agricultural and Mechanical University, Tallahassee, Florida, for making it possible to pursue the completion of my studies without interruption.

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THE STUDY

Introduction and Background

Learning to spell is part of learning to communicate in writing. The high social value placed on correct spelling and the degree of precision required to learn to spell satisfactorily make spelling instruction especially important.[1] Some teachers find the teaching of spelling a difficult task but know that if students are to communicate adequately in written language, teaching children to spell is important and that no teacher can afford to abdicate her responsibility for teaching spelling as effectively as possible.[2] The skill to use the sounds of the American English language as it is written, combined with meaning, is fundamental to both spelling and reading. There is ample evidence to conclude that

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[1]Edna M. Horrocks, Edith M. Evans, and Ralph C. Staiger, Spelling, Teachers Manual, Grade 2 (Boston: Ginn and Company, 1965), p. iii.

[2]Paul R. Hanna and Jean S. Hanna, "The Teaching of Spelling," The National Elementary Principal, XLV (November, 1965), 23-24.

phonetic knowledge and skills play an important part in spelling ability.[1]

Experts have studied and argued for a long time about just how much generalizations, or spelling rules, help in spelling. However, modern spelling programs generally are organized on the basis of similar phonetic and structural elements assumed to be essential to satisfactory achievement in spelling.

A significant number of research studies concerning instruction in phonics have been reported in the United States since the beginning of the period of re-emphasis on phonics. Morrone,[2] in a review of the literature, reported on one hundred ninety-eight studies related to instruction in phonics relevant to reading and spelling. He rejected a substantial number of studies because they did not meet the rigors of his established criteria for their review.

Theodore Clymer[3] initiated the present interest in the evaluation of phonic generalizations. In his study, each of forty-five phonic generalizations was applied to a

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[1]George Spache, "Spelling Disability Correlates I - Factors Probably Causal in Spelling Disability," Journal of Educational Research, XXXIV (April, 1941), 573.

[2]Victor E. Morrone, "A Critical Analysis of Scientific Research in Phonics" (unpublished Ed.D. dissertation, University of Pittsburgh, 1958), p. 18.

[3]Theodore Clymer, "The Utility of Phonic Generalizations in the Primary Grades," Reading Teacher, XVI (January, 1963), 252-258.

composite vocabulary of 2600 words to determine the words which were conformations of the generalizations and the words which were exceptions to the generalizations. The applicability of each generalization to the composite word list was thus revealed, and a per cent of applicability was determined for each generalization. Since this study, the results of several investigations have appeared in the literature, but only a few of these investigations were wholly concerned with the applicability of phonic generalizations to spelling programs. Considering the importance of spelling and the vast number of things to be taught to children in the elementary school, the economy of time through a wider utilization of phonic generalizations should be more assiduously explored.[1]

The Need for the Study

The most effective spelling program is related to reading and word recognition techniques and is given attention throughout the school day.[2] Dawson and Zollinger,[3]

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[1]Frederick S. Breed, "Generalization in Spelling," Elementary School Journal, XXXVII (May, 1937), 733.

[2]G. Wesley Sowards and Mary-Margaret Scoby, The Changing Curriculum and the Elementary Teacher (San Francisco: Wadsworth Publishing Company, Inc., 1961), p. 265.

[3]Mildred A. Dawson and Marian Zollinger, Guiding Language Learning (Yonkers-on-Hudson: World Book Company, 1957), pp. 409-410.

Gilbert,[1] Peake,[2] and Townsend[3] have investigated this relationship and have reported positive correlations. These correlations between reading and spelling suggest a reciprocal connection between the two phases of the language arts, with progress in one area contributing to growth in the other and leading to further growth in the first area. In the field of reading, Betts,[4] Durrell,[5] Harris,[6] and Russell[7] have found that good reading and good spelling go together and that poor readers are usually poor spellers.

Children in classrooms in elementary schools all over the United States receive instruction in spelling from one of a number of spelling series which provide complete programs for grades two through six or grades one through six.

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[1]Luther C. Gilbert, "Effect of Reading on Spelling in Ninth Grade," School Review, XLII (March, 1934), 197-204.

[2]Nellie Peake, "Relation Between Spelling Ability and Reading Ability," Journal of Experimental Education, IX (December, 1940), 192-193.

[3]Agatha Townsend, "An Investigation of Certain Relationships of Spelling with Reading and Academic Aptitude," Journal of Educational Research, XL (February, 1947), 464-471.

[4]Emmett A. Betts, Foundations of Reading Instruction (New York: American Book Company, 1954), pp. 8-11.

[5]Donald D. Durrell, Improving Reading Instruction (Yonkers-on-Hudson: World Book Company, 1940), p. 279.

[6]Albert J. Harris, How to Increase Reading Ability (New York: American Book Company, 1956), 266-351, passim.

[7]David H. Russell, "Spelling Ability in Relation to Reading and Vocabulary Achievement," Elementary English, XLIV (October-December, 1967), 768.

Personke and Knight explain that these spelling programs are remarkably similar, with possibly two exceptions:

> On the one hand there is some difference in the words presented from one textbook to the other. This is observed in grade levels selected for presentation of words rather than in the total of the words presented during the entire program. A second difference is reflected in the attention given to the teaching of spelling generalizations from one series to another.[1]

Hanna and Hanna advise that:

> The instructional area most neglected in the spelling programs is that of pupil-discovery of the behavior of phoneme-grapheme correspondences in his language and the rules and generalizations upon which the orthography is based.[2]

Interrelationships of phonics instruction in the reading program and in the spelling program have not been given adequate attention in educational research projects. Certainly the two programs should be carefully co-ordinated, and probably even partially fused or integrated.

Since phonic generalizations are important to both spelling and reading instruction, there is a need for more information relevant to the utility or applicability of phonic generalizations to spelling needs. Furthermore, research is needed which relates current reports of the utility or applicability of selected phonic generalizations in basal reading

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[1]Carl Personke and Lester Knight, "Proofreading and Spelling: A Report and a Program," Elementary English, XLIV (October-December, 1967), 768.

[2]Paul R. Hanna and Jean S. Hanna, "Application of Linguistics and Psychological Cues to the Spelling Course of Study," Elementary English, XLIII (November, 1964), 756.

programs to basic spelling programs. A contributory service can be made to spelling instruction by a study of the applicability of phonic generalizations to spelling programs, the introduction and maintenance of phonic generalizations in spelling programs, and the relative applicability of phonic generalizations to spelling programs and to reading programs. The present investigation was designed to make such a study.[1]

Statement of the Problem

The problem of this study was to determine the applicability of phonic generalizations to selected spelling programs. The following sub-problems were identified: (1) What is the extent of applicability of each generalization to the composite vocabulary of selected spelling series? (2) Which of the forty-five phonic generalizations are introduced and maintained in each spelling program, and on what grade level or levels? and (3) Are there differences in the applicability of the generalizations to spelling programs and to reading programs?

Basic Assumptions

The following assumptions were basic to this study:

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[1]Theodore Clymer and the International Reading Association have granted permission to the researcher to use the generalizations, procedures, and criteria reported as follows: Theodore Clymer, "The Utility of Phonic Generalizations in the Primary Grades," Reading Teacher, XVI (January, 1963), 252-258.

1. That the forty-five phonic generalizations identified by Clymer[1] in his study were representative of phonic generalizations that were applicable to elementary school spelling programs.

2. That the Clymer[2] and Bailey[3] studies of phonic generalizations offered suitable bases for comparison of the utility of phonic generalizations to spelling and reading programs in the elementary school.

3. That adequate "selection criteria" could be established for selecting representative and comprehensive spelling programs for analysis in the study.

Definition of Terms

The following operational definitions were relevant to this study:

Applicability or Utility refers to the extent that use of phonic generalizations results in correct pronunciation of unrecognized words or accurate spelling of unknown words. The number of conformations found for each phonic generalization investigated[4] was used as a measure of applicability.

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[1] Ibid.

[2] Ibid.

[3] Mildred Hart Bailey and the International Reading Association have granted permission to the researcher to use data reported in tabular form and to quote from the article reported as follows: Mildred Hart Bailey, "The Utility of Phonic Generalizations in Grades One Through Six," Reading Teacher, XX (February, 1967), 413-418.

[4] Clymer, op. cit., p. 255.

English Spelling signifies an attempt to have one standard spelling represent many variant pronunciations of one word.[1]

Phoneme-grapheme refers to sound-letter representation.

Phonetic Approach designates an arrangement of spelling words by sound and patterning according to phonetic principles.[2]

Phonics implies the application of phonetics to independent pronunciation and spelling of words.[3]

Phonics generalization indicates the application of phonetic elements, word structure, and syllabication to recall the spelling of studied words and to pronounce and spell independently new words with the same elements or spelling principles.[4]

Spelling denotes a representation of spoken sounds by written symbols.[5]

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[1]Ralph Williams, Phonetic Spelling (New York: Oxford University Press, 1960), p. 93.

[2]Carter V. Good, Editor, Dictionary of Education (New York: McGraw-Hill Book Company, Inc., 1959), p. 517.

[3]Ibid., p. 396.

[4]Gertrude Hildreth and Roberta LaCosta, Spellingtime, Teacher's Manual, Level C (Syracuse: The L. W. Singer Company, 1964), p. 15.

[5]Ibid., pp. 1-2.

Spelling rule expresses the regularity which appears when any vowel or consonant or cluster of letters is shown to correspond with a given pronunciation in an initial, medial or final position in the spelling of a word.[1]

Delimitations of the Study

The following were delimitations of the study:

1. The study was limited to an analysis of only six spelling programs currently published for use in elementary schools in the United States.

2. The study was restricted to an analysis of the spelling words contained in the basic word lists, the supplemental and/or extension word lists, the power spelling program list, and subject words lists in the textbooks for grades two through six in the different series.

3. The study was further limited by the exclusion of abbreviations, contracted forms, place names, proper names and adjectives, and words written with the apostrophe and s.

4. The study was limited by the utilization of the forty-five phonic generalizations identified by Clymer[2] in a recent study.

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[1]Raymond G. Kuhlen, Studies in Educational Psychology (Waltham, Mass.: Blaisdell Publishing Company, 1968), p. 416.

[2]Clymer, op. cit., pp. 252-258.

5. Lastly, the study was limited to Webster's New Collegiate Dictionary,[1] 1961 edition, as the authority for establishing pronunciation, accentuation, and syllabic-division for all words contained in the composite word list.

Materials Used in the Study

Germane to this investigation were the Clymer Study,[2] the Bailey Study,[3] Webster's New Collegiate Dictionary,[4] and the teacher edition of each basic speller, levels two through six, of the following series:

Silver Burdett Company, Inc., Series

Herman Benthus, and others, Spell Correctly (Morristown, N.J.: Silver Burdett Company, 1968).

Follett Publishing Company Series

Morton Botel, and others, Spelling and Writing Patterns (Chicago: Follett Publishing Company, 1968).

J. B. Lippincott Company Series

Theodore E. Glim and Frank S. Manchester, Basic Keys to Spelling (Philadelphia: J. B. Lippincott Company, 1967).

The L. W. Singer Company, Inc., Series

Gertrude Hildreth, and others, Spellingtime (New York: The L. W. Singer Company/A Division of Random House, Inc., 1964).

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[1] Webster's New Collegiate Dictionary (Springfield, Mass.: G and C Merriam Company, Publishers, 1961).

[2] Clymer, op. cit., pp. 252-258.

[3] Bailey, op. cit., pp. 413-418.

[4] Webster's New Collegiate Dictionary, op. cit.

Ginn and Company Series

Edna M. Horrocks, Edith M. Evans, and Ralph C. Staiger, Spelling (Boston: Ginn and Company, 1965).

The Economy Company Series

Charles C. Mason and Jess S. Hudson, A Phonetic Approach to Spelling Growth (Oklahoma City: The Economy Company, 1967).

Review of Related Literature

A three-part review and analysis of pertinent literature is presented. The first part reviews significant articles and research reports of the past several years on the value of teaching spelling generalizations or rules to improve pupils' spelling ability. The second part deals with the Stanford University spelling project. Because of the emphasis now placed on linguistics in modern spelling programs, the findings reported for this group of articles and research studies are of interest and importance to the study. The third part is concerned with recent studies of the utility of phonic generalizations. These studies were pertinent to the present investigation in terms of procedures, purposes, recommendations and conclusions.

The Contribution of Spelling Rules to Spelling Achievement

As early as 1907, Bromwell[1] studied the possibility of teaching children to read in phonetics before introducing

[1]George D. Bromwell, "Where and How Phonetic Spelling Should Be Used at Once," Elementary School Teacher, VII, (March, 1907), 385-389.

them to standard English. He found that phonetic spelling was of little help because of the irregularities of conventional spelling.

Cook[1] conducted a study in 1912 in which he used a list of fifty words to test seven rules in spelling and their exceptions. Without previous instruction in rules, the test was administered to students in a secondary school in Wisconsin. The investigator concluded that rules do not teach themselves and that teachers should insist on their being learned. Furthermore, he suggested that rules be taught in widely-spaced intervals and that they be introduced in the elementary school during the habit forming period when pupils still spell reflectively rather than automatically.

That a poor speller is readily identified by his writing was the thesis purported by Suzzallo[2] in 1913. He stated that the principal worth of teaching spelling rules is to give children independent power to spell words that are used in changing forms.

At one time the most widely accepted point of view on generalization in spelling was that of Ernest Horn. After reviewing the experiments bearing on the topic between 1910 and 1919, Horn said:

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[1]W. A. Cook, "Shall We Teach Spelling by Rules?" Journal of Educational Psychology, III (June, 1912), 316-325.

[2]Henry Suzzallo, The Teaching of Spelling (Boston: Houghton Mifflin Company, 1913), pp. 1-2.

> In light of present evidence one seems to be justified in recommending that the teaching of rules be abandoned until more conclusive evidence is presented to show that the time spent in teaching them is as productive of efficiency as the same amount of time spent in teaching words directly.[1]

Gates[2] concurred with this early point of view but suggested that rules and experiences be developed together so that each might be illuminated by the other.

Some examples of the logical analysis of the transfer of previously acquired phonics knowledge to learning to spell are the works of Tidyman[3] in 1922 and Horn[4] in 1929. Starting out with the root notion of transfer of learning, these analysts pointed out major aspects of the association between phonics and spelling. Later, Horn wrote:

> . . . there may be transfer due to the influence of past experience, but such transfer is not necessarily always desirable in learning new words. There is the possibility that when a child attempts to spell a word for the first time, he may be led into error by the fact that the individual sounds of the words have been spelled in a variety of ways in other words which the child has already learned to spell.[5]

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[1]Ernest Horn, "Principles of Method in Teaching Spelling As Derived from Scientific Investigations," Eighteenth Yearbook of the National Society for the Study of Education, Part II (Bloomington, Ill.: Public School Publishing Company, 1919), p. 55.

[2]Arthur I. Gates, Psychology for Students of Education (New York: The Macmillan Company, 1923), pp. 315-319.

[3]Willard F. Tidyman, The Teaching of Spelling (Yonkers-on-Hudson: World Book Company, 1922), p. 46.

[4]Ernest Horn, "A Source of Confusion in Spelling," Journal of Educational Research, XIX (January, 1929), 47-55.

[5]Ernest Horn, "The Influence of Past Experiences Upon Spelling," Journal of Educational Research, XIX (April, 1929), 283.

In another article, Horn said:

> Learning to spell four thousand different words seems a large task if each word must be learned as an individual task. . . . For while the unphonetic character of the English language constitutes a real obstacle to successful rationalization, it is not necessarily an unsurmountable one.[1]

Archer,[2] in 1929, reported that there could be some transfer in spelling if children were properly taught. He found that the amount of transfer depended upon three conditions: (1) the ability of the children, (2) the similarity of material, and (3) the instructional method. In 1930, Archer wrote:

> Children learn to spell only four or five thousand words; and yet we find many children using more words than this number. As a consequence, we must conclude either that transfer takes place, or that there is some other way of learning these additional words.[3]

The group of studies undertaken at Columbia University during the period of 1930-1940 was the result of a marked revival of interest in the problem of spelling generalizations or rules. Three of these projects are significant to the present study and are reviewed in the following paragraphs.

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[1]Ernest Horn, "The Child's Early Experience with the Letter 'A'," Journal of Educational Psychology, XX (March, 1929), 168.

[2]C. P. Archer, "Saving Time in Spelling Instruction," Journal of Educational Research, XX (September, 1929), 123-131.

[3]C. P. Archer, "Transfer of Training in Spelling," University of Iowa Studies, Studies in Education, V (June, 1930), 7-63.

As a part of her investigation of generalizations in spelling, Sartorius,[1] in 1931, presented data on the use and worth of spelling rules. She recorded all the rules from twenty spelling textbooks published since 1920. Twenty-seven rules which were found in five or more of the spellers were selected for examination and applied to a list of 4,065 commonly used words. The extent to which the rules applied to the words in the list and the extent of the exceptions were determined. Among five stated conclusions, the following one is directly relevant to the present investigation:

> If a rule is to be used in a textbook, it is important to know at what grade level it will appear first, at what grade level it will appear most frequently, and where there are the greatest number of exceptions, if any.[2]

In 1932, King[3] conducted a study for the purpose of determining the effects of teaching certain spelling rules in each of the grades three through eight. Four criteria were used to select the spelling rules: (1) the frequency of application to the spelling words of the elementary grades, (2) their distribution throughout the grades, (3) the number of exceptions to the rule, and (4) the probable ease of

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[1]Ina Craig Sartorius, Generalization in Spelling, Contributions to Education, Number 472 (New York: Bureau of Publications, Teachers College, Columbia University, 1931), pp. 9-12.

[2]Ibid., p. 56.

[3]Luella M. King, Learning and Applying Spelling Rules in Grades Three to Eight, Contributions to Education, Number 517 (New York: Bureau of Publications, Teachers College, Columbia University, 1932), pp. 1-80.

learning the rules. King found that all except two of the rules tested were understood and applied by grade children with enough success to warrant the time and effort expended in teaching them. That this ability could be made to transfer to everyday spelling was not ascertained.

A report of a two year study was submitted by Gates[1] in 1935. This investigation included two elaborately controlled experiments on the use of rules and the grouping of words. The subjects comprised 3,800 pupils in 106 classes in the Brooklyn, New York, public schools. Two of Gates main results accentuate the heuristics of the present study:

> 1. The Generalization Method produced greater ability than the Specific Learning Method to spell words not previously studied in the spelling class, from the same and higher grade levels. The superiority of the Generalization Group was estimated as six or eight per cent.
>
> 2. The Generalization Method produced greater ability to convert unstudied base forms into derived words by adding the suffixes s, es, d, ed, or ing, and to write words containing ei or ie and other common elements like in or tion. The superiority in the test of applying specific generalizations which were introduced to the Generalization Group was estimated to be about nine per cent.[2]

Wheat[3] selected for evaluation four spelling rules of wide applicability restated in what was considered "best

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[1]Arthur I. Gates, Generalization and Transfer in Spelling (New York: Bureau of Publications, Teachers College, Columbia University, 1935), 1-80.

[2]Ibid., pp. 77-78.

[3]Leonard B. Wheat, "Four Spelling Rules," Elementary School Journal, XXXII (May, 1932), 697-706.

form." The conclusion was reached that even "best rules" are of little assistance in reducing spelling errors.

Language arts specialists McKee,[1] Dolch,[2] Gates,[3] Hildreth,[4] Fitzgerald,[5] Betts,[6] and Horn[7] studied the problem of spelling rules through research and experimentation during the period 1940-1960. Three conclusions were common to all of the investigations: (1) most generalizations have limited usefulness because of their exceptions, (2) children tend to make their own generalizations, and (3) spelling rules function most effectively when they are taught inductively, that is, when they are formulated by students after, and as a result of, the sequential sound-to-letter experiences associated with "hear-say-spell" presentations.

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[1]Paul McKee, Language in the Elementary School (Boston: Houghton Mifflin Company, 1939), pp. 373-374.

[2]Edward William Dolch, Better Spelling (Champaign, Ill.: The Gerard Press, 1942), pp. 192-235, passim.

[3]Arthur I. Gates, "Reading in Relation to Spelling," Teachers Service Bulletin, VI (October, 1944), 1-4.

[4]Gertrude Hildreth, "Spelling in the Modern School Program," Twentieth Yearbook of the Department of Elementary School Principals (Washington, D.C.: Department of Elementary School Principals, National Education Association, July, 1941), pp. 477-482.

[5]James A. Fitzgerald, "Children's Experiences in Spelling," in Virgil E. Herrick and Leland B. Jacobs, editors, Children and the Language Arts (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1955), p. 261.

[6]Emmett A. Betts, "What About Spelling," Education, LXXVI (January, 1956), 320.

[7]Ernest Horn, "Phonetics and Spelling," Elementary School Journal, LVII (May, 1957), 425.

In 1960, Horn reiterated his stand on the benefits of teaching phonetic generalizations. He listed the following seven points which in his estimation were deterrents to the efficiency of the procedure:

> 1. Over one-third of the words in A Pronouncing Dictionary of American English have more than one acceptable pronunciation due to regional and cultural differences.
>
> 2. Many different spellings can be given most sounds and even the most common spellings have numerous exceptions.
>
> 3. A majority of words contain silent letters, and about a sixth are spelled with double letters even though only one of the letters may be pronounced.
>
> 4. Responses become uncertain when more than one reasonable choice is available, such as "bizzy" for busy.
>
> 5. Unstressed syllables characterized by the schwa or short i are very hard to spell by sound.
>
> 6. Any spelling rule, phonetic or orthographical, can be used incorrectly as well as correctly.
>
> 7. Some spelling elements are fairly consistent, such as word positions and the adding of prefixes and suffixes. More adequate evidence is needed to realize the value of relating sounds to symbols, but it appears that such value should be utilized as an aid to spelling rather than as a substitute for the direct study of these words.[1]

Later in the same article Horn stated:

> The only rules that should be taught are those that apply to a large number of words and have few exceptions. The following rules meet these requirements: (a) the rules for adding suffixes (changing y to i, dropping final silent e, doubling the final consonant);

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[1]Ernest Horn, "Spelling," Encyclopedia of Educational Research, 3rd edition, C. W. Harris, Editor (New York: Macmillan Company, 1960), p. 1345.

(b) the letter q is followed by u in common English words; (c) English words do not end in v; and (d) proper nouns and most adjectives formed from proper nouns should begin with capital letters.[1]

Sister Evangelist Marie[2] carried out an a posteriori study of the value of spelling by rule or no rules. She used three procedures: (1) the Inductive Method presented relevant words and developed the rule from them, (2) the Deductive Plan stated the principle and illustrated it by specific words, and (3) the Thought Procedure associated the words with their meaning and figured out the letters without the use of rules. Obtained results revealed that the Thought Method operated most successfully for all grade levels; and that the Inductive Method was the least successful of the three procedures.

Hoping to discover whether some order could be effected in the rules controversy, Yee,[3] in 1966, examined a large number of the published reports. He concluded from his critical survey that the controversy between spelling rules or no spelling rules was a false dichotomy. In summary, Yee stated:

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[1] Ibid., p. 1345.

[2] Sister Evangelist Marie, "A Study of Teaching Rules in Spelling," Elementary English, XXX (October, 1963), 602-604.

[3] Albert H. Yee, "The Generalization Controversy on Spelling Instruction," Elementary English, XLIII (February, 1966), 154-161.

> The question of spelling generalization is maturing into one of degree and points to the need to fully investigate classroom applications before curriculum materials and methods are recommended for widespread use.[1]

The value of teaching spelling rules has been questioned for several decades, and investigators still disagree on whether or not to teach generalizations and, if so, which ones. To date, there is no definite consensus related to the contributions of spelling rules to spelling achievement.

The Linguistics Approach to Spelling

Several studies have been concerned with the linguistic approach to spelling instruction. Reports from the Stanford Spelling Project reflect the general pattern of these investigations.

Hanna and Moore[2] reported on the latter's study[3] of the three thousand words most frequently used in children's writings in an effort to determine just how "phonetic" is American English orthography and the extent to which generalizations about sound-to-letter correspondences are useful. The investigators examined the three thousand words, paring each spoken sound with its written letter or combination of

---

[1] Ibid., p. 161.

[2] Paul R. Hanna and James T. Moore, Jr., "Spelling--from Spoken Word to Written Symbol," Elementary School Journal, LII (February, 1953), 329-337.

[3] James T. Moore, Jr., "Phonetic Elements Appearing in A Three Thousand Word Spelling Vocabulary (unpublished Ed.D. dissertation, Stanford University, 1951).

letters. That spelling which most frequently was used to represent each irreducible, meaningful speech sound was called the regular spelling; less frequently used spellings were called the irregular spellings. The pronunciation indicated in the Thorndike Century Senior Dictionary, 1941 edition, was used as the authority for the speech sounds. They stated that approximately eighty per cent of the phonemes analyzed were represented by a regular spelling. They concluded that American English orthography is quite "phonetic" and that generalizations about phoneme-letter correspondences are rather useful.[1]

To clarify the issue of the consistency with which American English phonemes are spelled, an intensive study was launched in 1962 at Stanford University of the relationship between phonemes and graphemes in a list of 17,310 words. This structural study of American English words was not concerned with the development of spelling rules or generalizations. Paul R. Hanna, with the participation of Richard E. Hodges, University of Chicago, and E. Hugh Rudorf, University of Delaware[2] conducted the study.

The research team examined as large a sample of American English words as was definitive and practical. Accordingly, the following procedures were used:

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[1]Hanna and Moore, op. cit., pp. 329-337.

[2]Richard E. Hodges and E. Hugh Rudorf, "Searching Linguistics for Cues for the Teaching of Spelling," Elementary English, XLII (May, 1965), 528-529.

1. The first twenty thousand words from the Thorndike-Lorge Teachers Word Book of 30,000 Words were used.

2. Proper names, contracted word forms, hyphenated words, abbreviations, archaic and poetic words, foreign words, trade names, slang and dialectal words, and words listed as "rare" in standard dictionaries, were eliminated.

3. Supplementation to the basic word list was made by selecting 2,026 words from Webster's New Collegiate Dictionary which included words that had entered the lexicon in recent years.[1]

The list of 17,310 words permitted the research team to analyze phoneme-grapheme correspondences at the following two levels: (1) sound-to-letter correspondences whenever they occur in words, and (2) sound-to-letter correspondences as they occur in position in stressed and unstressed syllables.

In order to maintain a consistent sound system throughout the analysis, a pronunciation system was employed that included thirty consonant phonemes and twenty-two vowel phonemes. Additional sounds included in the pronunciation system were those vowel sounds heard before r in words and before certain diphthongs. The results of the several analyses carried out by the investigators showed that large numbers of consistent phoneme-grapheme correspondences occur at least eighty per cent of the time in some position in stressed and unstressed syllables.[2]

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[1] Ibid.

[2] Ibid.

After the completion of the Stanford Spelling Project, Hodges wrote:

> These findings indicate that a mastery of American-English spelling might be made easier by capitalizing on consistent sound-to-spelling correspondences and on the "rules" for making correct associations between phonemes and graphemes.[1]

Hanna and Hanna found that the Spelling Project:

> . . . generated statistical evidence which gave them priority ranking in predicting the spelling of phonemes at a level of about eight-four per cent accuracy; and when environmental factors are added to those of phoneme position and stress, the accuracy increases by several percentage points to 89.6 per cent.[2]

In an article which discussed the psychological basis of spelling, Hodges concluded:

> Available evidence from linguistic studies of the orthography, from neurophysiological research, and from psychological investigations, suggests a rather drastic revision of current instructional practices in the teaching of spelling. . . . it becomes clear that aural-oral abilities have the highest priority in the spelling process.[3]

English spelling traditionally was assumed to be so inconsistent that every word to be learned posed a separate learning task. The Stanford Spelling Project was instrumental in promoting the knowledge that there is a high degree

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[1]Richard E. Hodges, "The Case for Teaching Sound-to Letter Correspondences in Spelling," A Report on the Stanford Spelling Project, Elementary School Journal, LXVI (March, 1966), 335.

[2]Hanna and Hanna, op. cit., p. 754.

[3]Richard E. Hodges, "The Psychological Bases of Spelling," Elementary English, XLII (October, 1965), 633-634.

of regularity in the relationship between phoneme-grapheme representation in spelling.

Utility of Phonic Generalizations

Only a few of the studies that were reported in the literature wholly pertained to the utility of phonic generalizations in spelling programs. Using spelling words that were one year in advance of their respective grade levels, Carroll[1] conducted an experimental study on the comparative ability of bright and dull children to generalize in spelling. He concluded from his obtained results that bright children generalize phonetically more than dull children. The study also revealed that dull children make nine times as many errors as bright children through substituting irrelevant or illogical spellings for the correct spelling. These irrelevant spellings, in Carroll's judgment, show a lack of ability to generalize. On the other hand, bright children make minor errors in doubling a letter, or in omitting the second letter of a double, because of their excellent phonetic transfer. Among Carroll's chief conclusions, this one is significant to the present study: "Generalizing ability should be cultivated in pupils in the highest degree possible."[2]

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[1]Herbert A. Carroll, "Generalization of Bright and Dull Children: A Comparative Study with Special Reference to Spelling," The Journal of Educational Research, LII (May, 1960), 489-499.

[2]Ibid., p. 498.

Aaron's[1] assessment of teacher and prospective teacher knowledge of phonic generalizations contributed much information to the problem of phonic generalizations in spelling instruction. The primary purposes of this study were: (1) to assess teacher and prospective teacher knowledge of phonic generalizations, and (2) to determine the relation between knowledge of phonics principles and amount of teaching experience and present teaching grade level or preference. Subjects used in the study were prospective teachers, currently employed teachers, and a few principals. A five-option, sixty-item, multiple-choice test was constructed to measure knowledge of eight phonic generalizations usually taught at second and third grade reading difficulty levels. Two of the findings that are significant to the present interest in phonic generalizations are:

> 1. Teachers, prospective teachers and principals need further information on how to teach phonics generalizations, as evidenced by the subjects used in the study.
>
> 2. Primary teachers do not score better on a test of phonic generalizations than do upper grade teachers, even though primary teachers are frequently the ones who have the main task of teaching these skills to children.[2]

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[1] I. E. Aaron, "What Teachers and Prospective Teachers Know About Phonics Generalizations," Journal of Educational Research, LIII (May, 1960), 326.

[2] Ibid., p. 330.

Heilman,[1] Jameson,[2] and Lee[3] urged the utilization of phonic generalizations even though some confusion and difficulty occasionally are experienced. They further suggested that such inconvenience be avoided by also teaching the exceptions to the phonic generalizations.

Wiest[4] explored the problem of spelling generalizations in 1966. The major problem of her study was to determine whether spelling generalizations are more effective in promoting spelling achievement than are the conventional "drill" methods. Her subjects were 2,858 children enrolled in grades two through six in the public schools of Austin, Texas, and 106 student teachers. Two generalizations for each grade and the following three groups of test words were selected: (1) words which directly applied to one generalization for a particular grade level, (2) words which nearly applied to a generalization, but could not be correctly spelled only with the use of the generalization, and (3) words

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[1]Arthur W. Heilman, Phonics in Proper Perspective (Columbus, Ohio: Charles E. Merrill Books, Inc., 1964), p. 19.

[2]Marshall C. Jameson and William Vernon Hicks, Elementary School Curriculum (New York: American Book Company, 1960), p. 292.

[3]J. Murray Lee and Dorris May Lee, The Child and His Curriculum (New York: Appleton-Century-Crofts, Inc., 1960), p. 347.

[4]Ethel Edna Wiest, "Phonetic Generalization in Spelling" (unpublished Master of Arts thesis, University of Texas, 1966), p. 17.

which had no relationship to any generalization taught at a particular grade level. Wiest concluded that the time spent in instruction of specific phonetic generalizations did not produce spelling ability greater than if instruction had not occurred at all, and that such instruction did not appear to be worthwhile.

Personke[1] recently conducted two studies using Scottish and American subjects. The first of these two studies was carried out with children of ages seven, eleven, and fourteen years. He found that at each age level the Scottish samples made more use of phonic generalizations in their attempts to spell unfamiliar words than did American samples. Personke concluded that his findings were indicative of the usefulness of phonic generalizations as a means of attack on unfamiliar words.

Hypothesizing that phonic generalizations are more helpful to slower children than to quicker ones, Personke[2] organized a second investigation to test his hypothesis. The national samples at age fourteen, the highest maturational level of the first study, were stratified according to scores on the spelling tests. The same tests of phonetic rendition

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[1]Carl Personke, "Spelling Achievement of Scottish and American Children," Elementary School Journal, LXVI (March, 1966), 337-343.

[2]Carl Personke, "Effect of Systematic Instruction on Ability to Generalize in Spelling," Elementary School Journal, LXVIII (November, 1967), 71-73.

that were used in the first study were again used with each stratified sample in the second study. Other procedures and criteria that were employed in the 1966 study were replicated. From his obtained results, Personke drew the following conclusions:

1. The Scottish children spelled better than the American children.

2. Differences in spelling ability were greatest among the poorer spellers, and in each case, differences favored the Scottish children.

3. Children in the higher intelligence quotient ranges tended to make phonetic generalizations with or without direct instruction.[1]

Clymer[2] investigated the utility of phonic generalizations in a composite word list taken from selected basal reading series and Gates Reading Vocabulary for Primary Grades. Concerning children's ability to apply phonic generalizations, Clymer warned:

1. Many generalizations which are commonly taught are of limited value.

2. Children should be made aware of the many exceptions to most of the generalizations that are taught them.

3. On the basis of study, current "extrinsic" phonic programs which present large numbers of generalizations are open to question.[3]

The present investigation utilized the following contributions from the Clymer study:

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[1] Ibid., p. 75.

[2] Clymer, op. cit., 252-258.

[3] Ibid., pp. 255-258.

1. The forty-five phonic generalizations which are recorded in Appendix A of this study.

2. The criteria for degree of application of each generalization.[1]

Bailey,[2] in 1965, replicated Clymer's[3] study with a composite list of 5,773 words taken from basal reading materials for grades one through six. Her major recommendations which have important implications to this investigation are as follows:

1. Careful and critical consideration should be given to the teaching of phonic generalizations.

2. Vocabulary derived from curriculum areas other than reading should be utilized in research relative to the utility of phonic generalizations.

3. The obtained per cent of utility for each generalization as it is listed in tabular form.[4]

Emans[5] tested phonic generalizations against a word list of 1,944 words beyond the primary level. Using Clymer's[6] procedures and restatements of the forty-five generalizations, Emans determined the utility of each generalization.

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[1] Ibid., pp. 254-255.

[2] Mildred Hart Bailey, "An Analytical Study of the Utility of Selected Phonic Generalizations for Children in Grades One through Six," (unpublished Ed.D. dissertation, University of Mississippi, 1965), p. 35.

[3] Clymer, op. cit., pp. 252-258.

[4] Bailey, op. cit., p. 89.

[5] Robert Emans, "The Usefulness of Phonic Generalizations Above the Primary Grades," The Reading Teacher, XX (February, 1967), 419-425.

[6] Clymer, op. cit., pp. 252-258.

Important differences between the results of the two studies were reported as follows:

> 1. Five generalizations which were found by Clymer to be useful for words on the primary level were not found to be useful for words beyond the primary level.
>
> 2. Three generalizations met the criteria on words beyond the primary level in Clymer's study, but they failed to meet the criteria for words on the primary level.[1]

Burmeister[2] compared seven studies which scientifically investigated the value of phonic generalizations, structural analysis, and accent generalizations in teaching materials in the field of reading. She concluded that the utility level of several of the generalizations would increase if: (1) vowels were looked at as either single vowels or double vowels, and (2) the level of difficulty of words in general was disregarded in the utility level for a generalization.

Summary

During the first thirty years of the present century, writers almost universally agreed that each spelling word represented a separate learning problem for children. Beginning in 1930, investigators suggested that generalizing in spelling facilitated transfer of training from taught to untaught words. The period between 1940-1960 showed a

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[1] Emans, op. cit., p. 424.

[2] Lou E. Burmeister, "Usefulness of Phonic Generalizations, The Reading Teacher, XXI (January, 1968), 349-356.

continuing interest in the usefulness of spelling rules. By 1960, significant and informative experimental research was in progress on the phonetic quality of English spelling. The linguistic approach to spelling gained wide recognition and found its way into many modern spelling programs for the elementary school. Recent studies of the utility or applicability of phonic generalizations have introduced a new phase of research.

CHAPTER II

PROCEDURES

This research extended the Clymer[1] and Bailey[2] studies of the utility of forty-five phonic generalizations in reading programs to spelling programs. The list of generalizations and procedures developed by Clymer[3] were utilized in this study.

Selection of Spelling Programs

The first step in conducting the study was the selection of spelling programs for analysis. Textbooks in Print[4] was checked to ascertain elementary school spelling series currently in print in the United States. This publication listed a total of thirty-five different spelling series for elementary schools that were free of any special group interest emphasis. The following criteria were established for selecting series for analysis:

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[1]Clymer, op. cit., pp. 252-258.

[2]Bailey, op. cit., pp. 413-418.

[3]Clymer, op. cit., pp. 252-258.

[4]Textbooks in Print (New York: R. R. Bowker Company, 1966, 1967).

1. The spelling program is described by the author and the publisher as a phonetic approach to spelling instruction.

2. The series was written or revised and published during or since 1964.

3. The series provides separate textbooks for grades two through six.

4. At least seven of the phonic generalizations evaluated by Theodore Clymer[1] are presented in depth in the spelling textbooks for grades two through six in the series.

5. Two series are representative of each of the following approaches to spelling instruction: (a) spelling programs employing a phonic/linguistic approach to spelling with phonic generalizations listed in the textbooks, thus giving limited support to learning to spell by the deductive method; (b) programs organized on the basis of a linguistic approach to spelling instruction, with phonic generalizations taught wholly by the inductive or discovery method; and (c) programs showing versatility in their organization and employing a variety of approaches to spelling instruction.

6. The publisher must grant permission for the series to be analyzed as part of this study.

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[1]Clymer, op. cit., pp. 252-258.

Fourteen of the publishers whose spelling programs were listed in Textbooks in Print[1] were contacted for additional printed information on their spelling series. These fourteen publishers were chosen because their programs seemed to satisfy the established standards for selecting spelling series. Upon receipt of the requested information, a thorough evaluation was made of the main features of each spelling program. The following six series were selected for analysis because they met all the listed criteria:

Silver Burdett Company, Inc., Series

Herman Benthus, and others, Spell Correctly, Grades 2-6 (Morristown, N.J.: Silver Burdett Company, 1968).

Follett Publishing Company Series

Morton Botel, and others, Spelling and Writing Patterns, Books B-F (Chicago: Follett Publishing Company, 1968).

J. B. Lippincott Company Series

Theodore E. Glim and Frank S. Manchester, Basic Keys to Spelling, Books 2-6 (Philadelphia: J. B. Lippincott Company, 1967).

The L. W. Singer Company, Inc., Series

Gertrude Hildreth, and others, Spellingtime, Levels B-F (New York: The L. W. Singer Company/A Division of Random House, Inc., 1964).

Ginn and Company Series

Edna M. Horrocks, Edith M. Evans, and Ralph C. Staiger, Spelling, Books 2-6 (Boston: Ginn and Company, 1965).

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[1] Textbooks in Print, op. cit.

The Economy Company Series

Charles Mason and Jess S. Hudson, A Phonetic Approach to Spelling Growth, Grades 2-6 (Oklahoma City: The Economy Company, 1967).

Selection of the Generalizations

Permission was obtained from Theodore Clymer[1] to utilize the generalizations, procedure, and criteria of utility employed by him in his recent study of the utility of phonic generalizations in primary reading series. The list of generalizations is recorded in Appendix A. Clymer gave the following explanation of the generalizations:

> These generalizations consist of four types which deal with vowels, consonants, endings, and syllabication. Arbitrary decisions were made in assigning some of the generalizations to one or another of the four types since certain statements may be classified under two or more headings.
>
> A statement was considered a separate generalization if its phrasing excluded or included different sets of words than did another statement. For example, the generalization, "When there are two vowels side by side, the long sound of the first is heard and the second one is usually silent" and "When ea come together in a word, the first letter is long and the second is silent" were counted as two separate statements, although the second statement is a special application of the first.[2]

Compilation of the Composite Vocabulary

A composite vocabulary was compiled from the teacher editions of the textbooks for grades two through six, using all word lists identified as basic, supplementary, extension,

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[1]Clymer, op. cit., Chapter I, p. 6.

[2]Clymer, op. cit., p. 253.

power program, and subject words. The composite word list was controlled by restrictions stated herewith:

1. Each word was entered in the composite word list only once, even though it appeared in more than one series of spellers.

2. The following types of words were eliminated from the composite list: abbreviations, contracted forms, place names, names of persons, proper adjectives and words written with the apostrophe and s. Names of holidays, days of the week, and months of the year were retained. Also retained were foreign words that were common to English usage, for example, "señor."

3. Derivations were included under the following four conditions: (a) when they were uncommon; (b) when they changed the pronunciation of the base form of the word; (c) when they added a syllable to the base word; and (d) when only the derived form was listed.

4. Single-letter words found in the spelling lists were included, for example, "a."

A composite word list of 5,431 words was compiled from the six different series of spellers.

Recording of Word Pronunciations

Because certain changes were made in the phonetic system in 1963, and because the present study extended the per cent of utility of forty-five phonic generalizations to

include selected spelling programs as well as basal reading programs, Webster's New Collegiate Dictionary,[1] 1961 edition, was chosen as the dictionary of authority for the study. The phonetic respelling, accentuation and syllabic division of each word in the composite word list were determined and recorded. The dictionary of authority gave two pronunciations for many words. However, consistency of pronunciation, accentuation and syllabication was established and maintained by recording only the first listed pronunciation of each word.

Determination of Applicability of the Phonic Generalizations

The applicability of each of the forty-five phonic generalizations to the composite vocabulary was determined. An analysis of every word in the composite word list was made relative to each generalization. All words appropriate for testing the applicability of a generalization were recorded in alphabetical order under the statement of that generalization. Forty-five different lists of words, one for each phonic generalization, were compiled.

Using the dictionary of authority[2] for the investigation, all words on each of the forty-five separate lists were checked for pronunciation, accentuation and syllabic division. For the purposes of this study, the letters a, e, i, o, and u

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[1] Webster's New Collegiate Dictionary, op. cit.

[2] Ibid.

were considered vowels. In addition, w and y were considered vowels under the following conditions outlined by Heilman:

1. W functioned as a vowel
   a) When it was part of a vowel digraph
2. Y functioned as a vowel
   a) When it concluded a word which had no other vowel, for example, by.
   b) When it concluded words of more than one syllable, for example, happy.
   c) When it followed another vowel, for example, may.
   d) When there was no other vowel in the word or syllable, for example, gym.[1]

The remaining nineteen letters of the alphabet were considered consonants.

The applicability of each generalization was determined through the use of the appropriate list with the pronunciation, accentuation and syllabic-division for each word recorded. Each word was then identified as either a conformation of or exception to the generalization. A per cent of applicability was computed for each generalization by dividing the number of applicable words or incidents by the total number of words or incidents investigated for the generalization.

Criteria for Degree of Applicability

After the per cent of applicability was computed for each generalization, the following two criteria developed by

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[1]Heilman, op. cit., pp. 72-73.

Clymer were applied relevant to "what constituted a 'reasonable' degree of utility:

> 1. The first criterion was that the composite word list must contain a minimum of twenty words to which the generalization might apply. Generalizations with lower frequencies of application do not seem to merit instructional time.
>
> 2. The second criterion was a per cent of utility of at least seventy-five. To state the matter another way, if the pupil applied the generalization to twenty words, it should aid him in getting the correct pronunciation in fifteen of the twenty words.[1]

Determination of the Generalizations Taught in Each Series

The determination of which of the forty-five phonic generalizations were taught in each book of each series of spellers was part of the study. In order to collect this information, a study was made of the "Word Analysis Charts" and the context of each of the thirty textbooks. All generalizations were recorded whether they were stated for deductive learning or implied for inductive learning. Grade levels of introduction and maintenance and the number of series and textbooks in which they were presented were recorded. Chapter III reports these findings.

Comparison of the Applicability of Phonic Generalizations to Spelling and Reading Programs

A comparison of the applicability of the phonic generalizations to spelling and reading programs was the last

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[1]Clymer, op. cit., p. 255.

part of the study. Only those generalizations that met the "criteria of usefulness"[1] in both spelling and reading programs were considered. Chapter III reports these findings.

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[1] Ibid.

CHAPTER III

FINDINGS

This research was concerned with the applicability of forty-five phonic generalizations to the composite vocabulary of six spelling series, the introduction and maintenance of the generalizations in each of the series, and the relative applicability of the generalizations to spelling and reading vocabularies. Findings related to each of the three concerns are reported in this chapter.

Applicability of Generalizations to Spelling Programs

Related generalizations are grouped, and the percentages of applicability of the generalizations in a group are reported in a single table. When related generalizations were grouped, ordinal number was obviated but numerals preceding the generalizations as they are listed in Appendixes A, C, and D of this study are identical with the number order of the generalizations as they are listed in the Clymer[1] and Bailey[2] studies.

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[1]Clymer, op. cit., pp. 252-258.

[2]Bailey, op. cit., pp. 413-418.

Generalizations Related to Short Vowels

Three phonic generalizations related to short vowels. Table 1 presents the results of the investigation of applicability for the three generalizations.

Generalization Two.--Applicable words for this generalization were separated into three subgroups according to specific application: (1) a vowel as the middle letter in a word, (2) a vowel as one of the middle two letters in a word of four letters, and (3) a vowel within a word of more than four letters. A total of three hundred twenty-five applicable words occurred for the first case. Of this number, two hundred forty words were conformations of the specific application and eighty-five were exceptions to it. The per cent of applicability was seventy-four. There were three hundred seventy-nine applicable words for the second case. Two hundred forty-two of these words were conformations of the specific application and one hundred thirty-seven were exceptions. Sixty-four was the per cent of applicability. For the last case, there were two hundred thirty-eight applicable words. One hundred forty words conformed to the specific application and ninety-four were exceptions to it. The per cent of applicability was sixty-one. Composite tabulations for this generalization were as follows: nine hundred forty-two applicable words, six hundred twenty-six conformations, three hundred sixteen exceptions, and a per cent of applicability of sixty-six.

TABLE 1

APPLICABILITY OF GENERALIZATIONS RELATED TO SHORT VOWELS

	Generalization	Total Number of Words	Number of Words Conforming	Number of Exceptions	Per Cent of Applicability
2.	When a vowel is in the middle of a one-syllable word, the vowel is short.	942	626	316	58
	middle letter	(325)	(240)(chest)[a]	(85)(wrong)	(74)[a]
	one of the middle two letters in a word of four letters	(379)	(242)(silk)	(137)(dart)	(36)
	One vowel <u>within</u> a word of more than four letters	(238)	(144)(latch)	(94)(burst)	(65)
43.	When a word has only one vowel letter, the vowel sound is likely to be short.	840	560(black)	280(child)	67
44.	When there is one <u>e</u> in a word that ends in a consonant, the <u>e</u> usually has a short sound.	120	109(zest)	11(germ)	91

[a]Words in parentheses are examples of words that conform or of exceptions.

[b]Figures in parentheses indicate specific applications of the generalization.

Generalization Forty-three.--Two types of exceptions occurred for Generalization Forty-three: (1) words in which the vowel was given a sound other than the short sound of that vowel, for example, burth for birth; and (2) words in which the short sound of a different vowel was given, for example, swomp for swamp. A total of eight hundred forty applicable words contained five hundred sixty conformations of and two hundred exceptions to Generalization Forty-three. The per cent of applicability was sixty-seven.

Generalization Forty-four.--One hundred nine conformations of this generalization occurred among the one hundred twenty words analyzed for its applicability. Eleven words were exceptions. The per cent of applicability was ninety-one.

Generalizations Related to Long Vowels

Eight of the forty-five recommended generalizations directed attention to the spelling of words that contained long vowels. The findings of the investigation of their applicability are shown in Table 2.

Generalization One.--Because several of the applicable words for this generalization contained more than one incident of two vowels together, for example, coaxial and dictionaries, the number of incidents of occurrence of adjacent vowels was tabulated for conformation of or exception to the generalization. Further examination of the applicable words

TABLE 2

APPLICABILITY OF GENERALIZATIONS RELATED TO LONG VOWELS

	Generalization	Total Number of Words	Number of Words Conforming	Number of Exceptions	Per Cent of Applicability
1.	When there are two vowels side by side, the long sound of the first one is heard and the second is usually silent.	1893	612(yeast)[a]	1281(infield)[a]	32
3.	If the only vowel letter is at the end of a word, the letter usually stands for a long sound.	26	20(spy)	6(who)	77
4.	When there are two vowels, one of which is final e, the first vowel is long and the e is silent.	418	263(zone)	155(one)	63
8.	Words having double e usually have the long e sound.	140	120(teeth)	20(queer)	86
9.	When a word ends with silent e, the preceding a or i is long.	564	329(admire)	235(welfare)	58

TABLE 2--Continued

	Generalization	Total Number of Words	Number of Words Conforming	Number of Exceptions	Per Cent of Applicability
10.	In ay the y is silent and gives a its long sound.	60	50(display)	10(kayak)	83
17.	When y is used as a vowel in words, it sometimes has the sound of long i.	570	55(cycle)	515(gym)	10
37.	In many two- and three-syllable words, the final e lengthens the vowel in the last syllable.	437	212(unite)	225(medicine)	49

[a]Words in parentheses are examples of words that conform or of exceptions.

revealed that fifty-seven of them contained three vowels together, for example, quail and advantageous. Three words courageous, courteous, and outrageous, contained both two and three vowels together in each word. Two words, buoyancy and Halloween, were classified as words having one incident each of four adjacent vowels. No words were found which possessed more than four vowels together. Since the present generalization did not cover incidents of the occurrence of more than two vowels together, all words that had three or more adjacent vowels were eliminated from the tabulation of conformations and exceptions for Generalization One. Incidents of two vowels together in words occurred 1893 times. When these 1893 incidents were analyzed for pronunciation, there were six hundred twelve conformations of and 1281 exceptions to the generalization. A per cent of applicability of thirty-two was obtained.

Generalization Three.--Each applicable word for this generalization contained just three letters. Of the twenty-six words that were listed, twenty were conformations of the generalization, and six were exceptions. Seventy-seven was the per cent of applicability.

Generalization Four.--The composite word list contained a total of four hundred eighteen one-syllable words with two vowels, one of which was a final e. All of these words were analyzed for the investigation of Generalization Four. Two hundred sixty-three of them conformed to the

generalization, and one hundred fifty-five were exceptions to it. The per cent of applicability was sixty-three.

Generalization Eight.--One hundred forty applicable words occurred for this generalization, but in each of the two words levee and matinee, double e was not pronounced as long e. In eighteen additional words double e appeared before r; consequently, its sound was changed and modified. There were one hundred twenty conformations of the generalization and eighteen exceptions to it. Per cent of applicability was eighty-six.

Generalization Nine.--Single-and poly-syllabic words with silent e as their last letter occurred five hundred sixty-four times in the composite vocabulary of 5,431 words. Words that ended in consonant-le created a minor problem relative to their consideration as applicable words, but the dictionary of authority for the study confirmed the silent e status of final e in words such as amble, ample, and cradle. Three hundred twenty-nine conformations of the generalization, and two hundred thirty-five exceptions to it were recorded. Per cent of applicability was fifty-eight.

Generalization Ten.--In one word, kayak, the ay was pronounced as long i. It was further noted that ay in the spellings for the days of the week was pronounced di, with short i. Among the sixty applicable words for this generalization were fifty conformations and ten exceptions to the

generalization. A per cent of applicability of eighty-three was derived.

Generalization Seventeen.--A total of five hundred seventy applicable words was recorded for analysis. With the exception of forty-one additional words which were not applicable for investigation of Generalization Sixteen, the same list of words was analyzed for the investigation of both Generalization Sixteen and Generalization Seventeen. There were obtained fifty-five conformations, five hundred fifteen exceptions, and a per cent of applicability of ten for this generalization.

Generalization Thirty-seven.--Four hundred thirty-seven two- and three-syllable words were analyzed for the applicability of this generalization. Two hundred twelve words were conformations of the generalization, and two hundred twenty-five were exceptions to it. The per cent of applicability was forty-nine.

Thirty-two words of more than three syllables each were excluded from the tabulation of conformations and exceptions for the generalization. Analysis of the thirty-two words produced thirty four-syllable and two five-syllable words that ended in final e. There were eleven conformations and nineteen exceptions to the generalization among the four-syllable words; both of the five-syllable words were exceptions.

Generalizations Related to Vowel Digraphs and Phonograms

Table 3 reports the results of the investigation of generalizations that related to vowel digraphs and phonograms. Four generalizations comprised this group.

Generalization Six.--Four cases of specific application occurred for Generalization Six. The first case related to the digraph ai. Three words, airmail, dairymaid, and maintain, contained two incidents each of this digraph; therefore, the number of incidents of occurrence was tabulated rather than the number of words. One hundred thirty-seven incidents were listed for analysis; one hundred four of the incidents were conformations of the case of specific application, and thirty-six were exceptions to it. Per cent of applicability was seventy-four. Two hundred eight-two words were spelled with the digraph ea. When the words were analyzed for pronunciation, there were one hundred fifty conformations of the case of specific application and one hundred thirty-two exceptions to it. The per cent of applicability for this second case of specific application was fifty-three. The third case of specific application concerned the digraph oa. Fifty-five applicable words for this case of specific application produced fifty-two conformation of the case and three exceptions to it. Per cent of applicability was ninety-five. As the fourth case of specific application, the digraph ui was examined for its pronunciation in fifty-nine applicable

TABLE 3

APPLICABILITY OF GENERALIZATIONS RELATED TO VOWEL DIGRAPHS AND PHONOGRAMS

	Generalization	Total Number of Words	Number of Words Conforming	Number of Exceptions	Per Cent of Applicability
6.	The first vowel is usually long and the second silent in the digraphs ai, ea, oa, and ui.	536	309	227	58
	ai	(140)	(104)(bait)[a]	(36)(curtain)[a]	(74)[b]
	ea	(282)	(150)(steam)	(132)(great)	(53)
	oa	(55)	(52)(toast)	(3)(abroad)	(95)
	ui	(59)	(3)(nuisance)	(56)(quit)	(5)
7.	In the phonogram ie, the i is silent and the e has a long sound.	169	24(hygiene)	145(tries)	14
14.	The two letters ow make the long o sound.	107	58(arrow)	49(plow)	54
15.	W is sometimes a vowel and follows the vowel digraph rule.	159	59(marrow)	100(lawn)	37

[a]Words in parentheses are examples of words that conform or of exceptions.

[b]Figures in parentheses indicate specific applications of the generalization.

words. Three words were conformations of the case and fifty-six were exceptions to it. The per cent of applicability was five. When the results of the investigation of applicability of the four cases of specific application for Generalization Six were totaled, there were five hundred thirty-six applicable words, three hundred nine conformations of and two hundred twenty-seven exceptions to the generalization. Fifty-eight was the composite per cent of applicability.

Generalization Seven.--Twenty-four of the one hundred sixty-nine applicable words for this generalization were conformations; one hundred forty-five were exceptions. Per cent of applicability was fifteen.

Generalization Fourteen.--The word pow wow showed two incidents of the element ow; consequently, the number of incidents of occurrence of ow in words was counted rather than the number of words. A total of one hundred seven incidents was reported. When the one hundred seven incidents were examined for pronunciation of ow, fifty-eight words were conformations of the generalization, and forty-nine were exceptions to it. Per cent of applicability was fifty-four.

Generalization Fifteen.--o, a, and e were the vowels that preceded w in the applicable words for Generalization Fifteen. However, conformations occurred for the generalization only when o preceded w in a word. When a or e preceded w in a word, it was an exception to the generalization. The total number of applicable words was one hundred fifty-nine.

The number of words conforming to the generalization was fifty-nine; the number that were exceptions to it was one hundred. Per cent of applicability was thirty-seven.

Applicability of Generalizations Related to Indefinite Vowel Sounds

The vowels a and e have indefinite sounds when they are followed by certain letters. Table 4 presents findings of the investigation of generalizations related to the indefinite vowel sounds.

Generalization Twelve.--According to the dictionary of authority for the study, the sound of a as in was is the sound of short o as in odd. Sixty-seven applicable words occurred for this generalization. Fifteen of them were conformations of the generalization, and fifty-two were exceptions to it. The per cent of applicability was twenty-two.

Generalization Thirteen.--Double oo has two pronunciations: like oo in stool, and like oo in good. The examples listed by Clymer in his study indicated the sound of oo in stool; accordingly, this same sound was applied in determining the pronunciation of the applicable words for Generalization Thirteen. A total of twenty-six words was analyzed. There were eleven words that conformed to the generalization and fifteen that were exceptions to it. Per cent of applicability was forty-two.

Generalization Eighteen.--Because one word, audio-visual, contained two incidents of a followed by l, w, or u,

TABLE 4

APPLICABILITY OF GENERALIZATIONS RELATED TO INDEFINITE VOWEL SOUNDS

	Generalization	Total Number of Words	Number of Words Conforming	Number of Exceptions	Per Cent of Applicability
12.	When a follows w in a word, it usually has the sound of a as in was.	67	15(want)[a]	52(reward)[a]	22
13.	When e is followed by w, the vowel sound is the same as represented by oo.	26	11(flew)	15(dew)	42
18.	The letter a has the same sound (ô) when followed by l, w, and u.	335	116(bald)	219(final)	36
19.	When a is followed by r and final e, we expect to hear the sound heard in care.	28	27(share)	1(are)	96

[a]Words in parentheses are examples of words that conform or of exceptions.

the applicability of this generalization was computed upon the basis of the number of incidents of occurrence rather than the number of applicable words. One hundred sixteen incidents were conformations of the generalizations, and two hundred nineteen were exceptions to it. Per cent of applicability was thirty-five.

Generalization Nineteen.--Twenty-eight applicable words were listed for this generalization. Twenty-seven words were conformations of the generalization, and one was an exception to it. The per cent of applicability was ninety-six.

Generalizations Related to Vowel and Consonant Sounds

Five generalizations were cited for related vowel and consonant sounds. Table 5 presents the results of their investigation of applicability to spelling programs.

Generalization Five.--A vowel preceded the consonant r in 1,507 words. Inasmuch as several applicable words showed more than one incident of r preceded by a vowel, applicability for this generalization was determined upon the basis of the number of incidents of occurrence rather than upon the basis of number of words. Thirteen hundred one incidents were conformations of the generalization, and two hundred six were exceptions to it. Per cent of applicability was eighty-six.

Generalization Sixteen.--Five hundred twenty-nine words were examined for this generalization. In four hundred

TABLE 5

APPLICABILITY OF GENERALIZATIONS RELATED TO VOWEL AND CONSONANT SOUNDS

	Generalization	Total Number of Words	Number of Words Conforming	Number of Exceptions	Per Cent of Applicability
5.	The r gives the preceding vowel a sound that is neither long nor short.	1507	1301(orbit)[a]	206(ferry)[a]	86
16.	When y is the final letter in a word, it usually has a vowel sound.	529	452(cozy)	77(decay)	85
22.	When c is followed by e or i, the sound of s is likely to be heard.	273	234(cease)	39(social)	86
23.	When the letter c is followed by o or a, the sound of k is likely to be heard.	401	401(vacant)	. .	100
24.	The letter g often has a sound similar to that of j in jump when it precedes the letter i or e.	188	150(age)	38(gift)	80

[a]Words in parentheses are examples of words that conform or of exceptions.

thirty-five of the words, y was pronounced as short i, for example, comedy. In seventeen words y was pronounced as long i, for example, justify. Conformations of the generalization were accepted only in words in which y alone was pronounced as a vowel. For example, the word deny was considered a conformation but the word money was an exception because of the ey combination. Four hundred fifty-two words were conformations and seventy-seven were exceptions. Per cent of applicability was eight-five.

Generalization Twenty-two.--In some words, for example, cycle and fancy, y was the vowel that followed the letter c. Two words, circumference and science, contained two incidents each of c followed by e or i; therefore, applicability for Generalization Twenty-two was computed upon the basis of number of incidents of occurrence rather than upon number of words. Two-hundred seventy-three incidents were analyzed. Two hundred thirty-four of them were conformations of the generalization, and thirty-nine were exceptions. Per cent of applicability was eighty-six.

Generalization Twenty-three.--No problems were encountered relative to the investigation of applicability of this generalization. The sound of k for c was distinctive and easily identified when the latter was followed by o or a in a word or syllable. The number of incidents of occurrence of c followed by o or a was tallied because several words, for example, comical and concave, contained two incidents each

of c followed by o or a. All four hundred one of the applicable incidents were conformations of the generalization. Per cent of applicability was one hundred.

Generalization Twenty-four.--The word Thanksgiving appeared in one spelling series written in both upper and lower case t; as a result, it occurred twice in the list of applicable words for Generalization Twenty-four. One hundred fifty words were conformations of the generalization, thirty-eight were exceptions to it, and the per cent of applicability was eighty.

Generalizations Related to Silent Consonants

The findings of the investigation of applicability of phonic generalizations related to silent consonants are presented in Table 6. Five generalizations comprised this group.

Generalization Eleven.--There were fifty-nine applicable words for this generalization, forty of which were conformations. The remaining nineteen words were exceptions to the generalization. The per cent of applicability was sixty-eight.

Generalization Twenty-five.--All sixty-four applicable words for Generalization Twenty-five were also conformations of it. Per cent of applicability was one hundred.

Generalization Twenty-six.--All twenty applicable words for this generalization were conformations of silent

TABLE 6

APPLICABILITY OF GENERALIZATIONS RELATED TO SILENT CONSONANTS

	Generalization	Total Number of Words	Number of Words Conforming	Number of Exceptions	Per Cent of Applicability
11.	When the letter i is followed by the letters gh, the i usually stands for its long sound and the gh is silent.	59	40(sigh)[a]	19(eight)[a]	68
25.	When ght is seen in a word, gh is silent.	64	64(light	. .	100
26.	When a word begins with kn, the k is silent.	20	20(knee)	. .	100
27.	When a word begins with wr, the w is silent.	20	20(wreck)	. .	100
28.	When two of the same consonants are side by side, only one is heard.	699	629(blizzard)	70(nodded)	90

[a]Words in parentheses are examples of words that conform or of exceptions.

gh when ght was seen in a word. One hundred was the per cent of applicability.

Generalization Twenty-seven.--Twenty words in the composite word list began with wr, and every one of them was a conformation of this generalization. Per cent of applicability was one hundred.

Generalization Twenty-eight.--Six hundred ninety-nine incidents of occurrence of two of the same consonants side by side in a word were analyzed for investigation of the applicability of this generalization. Six hundred twenty-nine words conformed to the generalization and seventy were exceptions to it. The obtained per cent of applicability was ninety.

Generalizations Related to Consonant Digraphs

Four generalizations related to consonant digraphs. Table 7 reports the results of investigation of their applicability to spelling programs.

Generalization Twenty.--There were two or more different pronunciations for ch in the applicable words listed for this generalization, for example, ch pronounced k, and ch pronounced sh. As the generalization only referred to the fact that when c and h are together they make one sound, all pronunciations for this element in the list of applicable words for Generalization Twenty were counted as conformations of the generalization. All words were established as conformations. Per cent of applicability was one hundred.

TABLE 7

APPLICABILITY OF GENERALIZATIONS RELATED TO CONSONANT DIGRAPHS

	Generalization	Total Number of Words	Number of Words Conforming	Number of Exceptions	Per Cent of Applicability
20.	When c and h are next to each other, they make only one sound.	169	169(torch)[a]	. .	100
21.	Ch is usually pronounced as it is in kitchen, catch, and chair, not like sh.	169	144(merchant)	25(chef)	85
29.	When a word ends in ck, it has the same last sound as in look.	49	49(truck)	. .	100
41.	When the first vowel element in a word is followed by th, ch, or sh, these symbols are not broken when the word is divided into syllables and may go with either the first or second syllable.	74	74(feathers)	. .	100

[a]Words in parentheses are examples of words that conform or of exceptions.

Generalization Twenty-one.--Generalization Twenty-one is closely related to Generalization Twenty; in fact, the same list of words was analyzed relative to the applicability of both generalizations. Conformations for Generalization Twenty-one numbered one hundred forty-four; exceptions polled twenty-five words; a per cent of applicability of eighty-five occurred.

Generalization Twenty-nine.--Each of the forty-nine applicable words for this generalization was a conformation of it. Per cent of applicability was one hundred.

Generalization Forty-one.--Four words, authorship, dishcloth, toothache, and toothbrush, contained two incidents each of th, ch, or sh; therefore, the number of incidents of occurrence of these elements in the seventy-four applicable words was analyzed for conformation of or exception to the generalization. Each of the seventy-four words was a conformation. Per cent of applicability was one hundred.

Generalizations Related to Syllabic Division

Four generalizations related to syllabic division. The findings of the investigation of per cent of applicability for these generalizations are reported in Table 8.

Generalization Thirty-eight.--Two consonants followed the first vowel sound in 1,591 words in the composite word list. When the 1,591 words were analyzed for syllabic division, 1,273 of them were conformations of the generalization,

TABLE 8

APPLICABILITY OF GENERALIZATIONS RELATED TO SYLLABIC DIVISION

	Generalization	Total Number of Words	Number of Words Conforming	Number of Exceptions	Per Cent of Applicability
38.	If the first vowel sound in a word is followed by two consonants, the first syllable usually ends with the first of the two consonants.	1591	1273(fattest)[a]	318(ledger)[a]	80
39.	If the first vowel sound in a word is followed by a single consonant, that consonant usually begins the last syllable.	1301	642(bacon)	659(olive)	49
40.	If the last syllable of a word ends in le, the consonant preceding the le usually begins the last syllable.	132	127(eagle)	5(tackle)	96
42.	In a word of more than one syllable, the letter v usually goes with the preceding vowel to form a syllable.	193	132(movies)	61(favor)	68

[a]Words in parentheses are examples of words that conform or of exceptions.

and three hundred eighteen were exceptions to it. Per cent of applicability was eighty for Generalization Thirty-eight.

Generalization Thirty-nine.--A total of 1,301 words was analyzed for the applicability of this generalization. Six hundred forty-two of the words were conformations of the generalization, and six hundred fifty-nine were exceptions to it. The per cent of applicability was forty-nine.

Generalization Forty.--The last syllable in one hundred thirty-two words ended in le. When the one hundred thirty-two words were analyzed for syllabic division, one hundred twenty-seven of them were conformations of the generalization, and five were exceptions to it. Ninety-six was the per cent of applicability.

Generalization Forty-two.--The letter v was joined with a preceding vowel in a word to form a syllable in one hundred thirty-two of the applicable words for this generalization. In sixty-one of the words, v was an exception to the rule. The per cent of applicability was sixty-eight.

Generalizations Related to Accented Syllables

Generalizations related to accented syllables occurred in the textbooks for the upper elementary grades. Table 9 presents the findings for this group of generalizations.

Generalization Thirty.--All two-syllable words with accented first syllables, whether they were primary, secondary, or equal accents, were listed as applicable words for

TABLE 9

APPLICABILITY OF GENERALIZATIONS RELATED TO ACCENTED SYLLABLES

	Generalization	Total Number of Words	Number of Words Conforming	Number of Exceptions	Per Cent of Applicability
30.	In most two-syllable words, the first syllable is accented.	2244	1846(quarter)[a]	398(hello)[a]	82
31.	If a, in, re, de, or be is the first syllable in a word, it is usually unaccented.	347	281(decide)	66(area)	81
32.	In most two-syllable words that end in a consonant followed by y, the first syllable is accented and the last is unaccented.	199	195(candy)	4(deny)	99
33.	One vowel letter in an accented syllable has its short sound.	2943	1693(zoology)	1250(volcano)	68
34.	When y or ey is seen in the last syllable that is not accented, the long sound of e is heard.	431	. .	431(merry)	. .

TABLE 9--Continued

	Generalization	Total Number of Words	Number of Words Conforming	Number of Exceptions	Per Cent of Applicability
35.	When ture is the final syllable in a word, it is unaccented.	23	23(venture)	. .	100
36.	When tion is the final syllable in a word, it is unaccented.	116	116(election)	. .	100
45.	When the last syllable is the sound r, it is unaccented.	828	676(under)	152(repair)	82

[a]Words in parentheses are examples of words that conform or of exceptions.

Generalization Thirty. A total of 2,244 words was analyzed; 1,846 of the words were conformations of the generalization, three hundred ninety-eight were exceptions to it. Per cent of applicability was eighty-two.

Generalization Thirty-one.--Three hundred forty-seven applicable words occurred for this generalization. Two hundred eighty-one of the words were conformations of the generalization; sixty-six words were exceptions to it. Per cent of applicability was eighty-one.

Generalization Thirty-two.--For investigation of the applicability of this generalization, one hundred ninety-nine words were examined for accented first syllables. One hundred ninety-five of the words were conformations of the generalization, and four were exceptions to it. The per cent of applicability was ninety-nine.

Generalization Thirty-three.--The largest number of applicable words for a generalization occurred for this one. A total of 2,791 words was listed, but the number of incidents of occurrence of one vowel sound in an accented syllable was 2,943; consequently, the applicability of Generalization Thirty-three was computed upon the basis of the number of incidents of occurrence rather than upon the basis of number of words. Two hundred thirty-three words contained two incidents each of one vowel in an accented syllable, and two words, differentiation and transcontinental, contained three incidents each of one vowel in an accented syllable. Words

conforming to the generalization polled an overall total of 1,693. Exceptions totaled 1,250 words. The per cent of applicability was sixty-eight.

Generalization Thirty-four.--Each of the four hundred thirty-one applicable words for this generalization was an exception to it. A zero per cent of applicability resulted for Generalization Thirty-four.

Generalization Thirty-five.--Twenty-three words were analyzed for investigation of applicability of this generalization. Each word was a conformation of the generalization. One hundred was the per cent of applicability.

Generalization Thirty-six.--One hundred sixteen words showed tion as their final and unaccented syllable. There were no exceptions to the generalization. Per cent of applicability was one hundred.

Generalization Forty-five.--The placement of the sound r in the last syllable of a word was left unclear by the wording of Generalization Forty-five. After consideration of the position of r at the beginning of a syllable as in vi-rus, as one of the middle letters in a syllable, for example, u-ni-verse, and as the last letter in a syllable, as in the word un-fair, the decision was made to consider the sound r in any position in the last syllable of a word as a conformation of the generalization. Of the eight hundred twenty-eight words analyzed for applicability of the generalization, six hundred seventy-six were conformations and one

hundred fifty-two were exceptions. Per cent of applicability was eighty-two.

Summary

According to Criterion One,[1] at least twenty applicable words were needed for the investigation of applicability of each generalization. Using this criterion, all forty-five generalizations were investigated. However, applicable words listed for generalizations numbered 26 and 27 barely met the stipulation. In addition, there were fewer than thirty applicable words for generalizations numbered 3, 13, 19, and 35.

A per cent of applicability ranging from ninety to one hundred was obtained for generalizations numbered 19, 20, 23, 25, 26, 27, 28, 29, 32, 35, 36, 40, 41, and 44. Predominant among this group of generalizations were those that related to consonants.

Twelve generalizations numbered 3, 5, 8, 10, 16, 21, 22, 24, 30, 31, 38, and 45 had percentages of applicability ranging from seventy-seven to eighty-six. Predominant among this group of generalizations were those that related to vowel sounds and to accented syllables.

A per cent of applicability greater than zero but less than seventy-five was obtained for generalizations numbered 1, 2, 4, 6, 7, 9, 11, 12, 13, 14, 15, 17, 18, 33, 37, 39, 42,

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[1]See Chapter II, page 39.

and 43. These eighteen generalizations related to the pronunciation of vowels in single-syllable words, digraphs, syllabic division, and in accented and unaccented syllables. Three generalizations in this group had more than twelve hundred applicable words or incidents each: there were 2,943 incidents for Generalization Thirty-three, 1,301 applicable words for Generalization Thirty-nine, and 1,893 incidents for Generalization One.

Generalization Thirty-four remained irrelevant to the composite word list with a per cent of applicability of zero. No conformations of the generalization appeared among the four hundred thirty-one applicable words. Y and ey were pronounced as short i in four hundred twenty-five of the words and as long i in the remaining six words.

Generalizations Two and Six warranted special consideration as each contained cases of specific application for investigation of applicability. Regarding Generalization Two, the first of the three cases of specific application related to a vowel as the middle letter in a word of more than two letters. The second case referred to a vowel as one of the middle two letters in a word of four letters, and the third case related to one vowel within a word of more than four letters. The percentage of applicability for these three cases of specific application ranged from seventy-four for the first case to sixty-one for the third case. Sixty-seven was the overall per cent of applicability for Generalization Two.

Four cases of specific application for Generalization Six related to the vowel digraphs ai, ea, oa, and ui. The findings of applicability for these digraphs did not settle the desideratum as to whether all of them should be taught in spelling programs, but they did give evidence that generalizing about the digraph oa is beneficial ninety-five per cent of the time; generalizing about ai is beneficial seventy-four per cent of the time. But generalizing about ea, a common vowel digraph in elementary school spelling lists, was doubtful, and generalizing about the digraph ui appeared to be a total waste of time. The overall per cent of applicability for Generalization Six was fifty-seven.

The applicability of twenty-six of the forty-five phonic generalizations was demonstrated. Of the remaining nineteen generalizations, the individual per cent of applicability of five was less than nine percentage points under the seventy-five per cent criterion. The per cent of applicability for each of fourteen generalizations was far below the utility mark accepted for the study.

Table 13, Appendix C, summarizes the findings of the investigation of each of the forty-five phonic generalizations.

Introduction and Maintenance of Generalizations in the Spelling Series

Because of the way in which Generalizations Two and Six were stated, only their cases of specific application were

analyzed relevant to introduction in the series. The two generalizations themselves were not included in listing the number of generalizations introduced in the series. The grade level on which a generalization was stated or implied for the first time in a series was selected as the grade level of introduction of that generalization in that series. It follows that some of the generalizations were counted more than one time as they were introduced in different series on different grade levels. Instead of 300 introductions (number of series times number of generalizations and cases of specific application), there were 282 introductions (number of generalizations introduced times number of series in which introduced) for the generalizations in the six different series.

New research into the nature of the spelling problem influenced the organization of several of the series. Significant new findings incorporated into the spelling programs included non-graded spelling lists in one complete series, multi-level word lists with words below and above grade level in difficulty in two series, and supplementary spelling lists for more able pupils in two more of the series. As a result, grade placement of words varied among the series and generalizations usually applicable to intermediate grades spelling lists were sometimes applicable to the word lists for the primary grades. Table 10 presents the number of generalizations and number of cases of specific application introduced, grade

TABLE 10

INTRODUCTION OF GENERALIZATIONS BY GRADE LEVEL AND BY NUMBER OF SERIES

Number of Generalizations and Specific Applications Introduced		Number of Introductions Per Grade Level and Series	
Generalizations	Specific Applications	Grade Level	Series
5	4	2	6
5		2	5
7	1	2	4
8	1	2	2
9		2	2
11		3	4
3		3	3
9	1	3	2
10	2	3	1
4	2	4	2
13		4	1
1		5	2
6	1	5	1
7		6	1

level on which they were introduced, and the number of series in which they were introduced.

Introduction of Generalizations

Analysis of the pattern of introduction of the generalizations in the series revealed that the majority of the generalizations were introduced in grade two, although relatively large numbers were introduced in grades three and four. Thirty-four generalizations and six cases of specific application were introduced for the first time in grade two. All four types of generalizations were represented in this group, but those that related to vowel sounds were greatest in number. Twenty-five generalizations and three cases of specific application related to the four types of generalizations were introduced in grade three. Generalizations that related to consonants and consonant elements were in the majority for this group. The pronunciation of indefinite vowel sounds and difficult consonants was most often referred to in the seventeen generalizations and two cases of specific application that were introduced in grade four. Other generalizations that were introduced in this grade related to silent consonants and syllabic division. One generalization that related to accented syllables was introduced in two series and each of six generalizations and one case of specific application related to vowel sounds, accented syllables, single consonants, prefixes and suffixes were introduced in grade five in

one series. Each of seven generalizations related to adjacent like consonants, the word element le, and some of the same generalizations presented in grade five were introduced in grade six in one series. Generalizations numbered 1, 4, 8, 9, 44, and specific applications one and two of Generalization Two were introduced in grade two in each of the six series.

Maintenance of Generalizations

Maintenance of a generalization in a series refers to (1) its statement or implication in each of the thirty textbooks, and (2) its application to the word lists in these textbooks. The value of the phonic generalizations to spelling programs depended upon their applicability to the spelling lists which comprised each series; consequently, an organization which showed applicable words for each generalization on each grade level two through six afforded the widest application possible for the generalizations. However, informal analysis of number of maintenance operations possible in the six series revealed a total of 1,350 separate maintenance operations (forty-five generalizations times thirty textbooks). Eight hundred thirty-seven operations actually occurred. Maintenance of at least seven of the forty-five phonic generalizations in depth in a series was important in the selection of spelling programs used in the study. Therefore, for the purposes of this study, a generalization was accepted to be maintained in depth in a series when it was first introduced

or implied in a textbook for grade two or three and extended in its application to the word lists in all textbooks through grade six. The name of the series, grade levels, number of series, and number of textbooks in which each generalization was maintained are shown in Table 11.

None of the nine generalizations that showed percentages of applicability of one hundred was maintained in all thirty spellers. Maintenance among this group of generalizations was as follows: one in twenty-two textbooks, a second in twenty, and a third in nineteen. The remaining six generalizations were maintained in three to fifteen spellers.

Five generalizations were maintained in the textbooks as follows: one generalization with ninety-eight per cent applicability in two textbooks; one of two generalizations with ninety-six per cent applicability in ten spellers and the other in six spellers; one generalization with ninety-one per cent applicability in all thirty spellers; and one generalization with ninety per cent applicability in eighteen textbooks.

Eleven generalizations with percentages of applicability between eighty and eighty-eight were more frequently maintained in the textbooks than were those in the two previous percentage categories. From among this group, one generalization with a per cent of applicability of eight-six was introduced in all thirty spellers; three more generalizations with the same per cent of applicability in twenty-nine,

TABLE 11

MAINTENANCE OF GENERALIZATIONS IN THE SELECTED SPELLING PROGRAMS[a]

Generalization	Maintenance of Generalization in the Series by Grades						Summary		Per Cent of Applicability
	Series A	Series B	Series C	Series D	Series E	Series F	Number of Series	Number of Texts	
1. When there are two vowels side by side, the long sound of the first one is heard and the second is usually silent.	2-6	2-6	2-6	2-6	2-6	2-6	6	30	32
2. When a vowel is in the middle of a one-syllable word, the vowel is short.									
middle letter	(2-6)	(2-6)	(2-6)	(2-6)	(2-6)	(2-6)	6	30	(74)[b]
one of the middle two letters in a word of four letters	(2-6)	(2-6)	(2-6)	(2-6)	(2-6)	(2-6)	6	30	(64)
One vowel <u>within</u> a word of more than four letters	(4-6)	(4,6)	(2-6)	(3-6)	(5,6)	(2,3, 5,6)	6	20	(61)

TABLE 11--Continued

Generalization	Maintenance of Generalization in the Series by Grades						Summary		Per Cent of Applicability
	Series A	Series B	Series C	Series D	Series E	Series F	Number of Series	Number of Texts	
3. If the only vowel letter is at the end of a word, the letter usually stands for a long sound.	2,3	. .	2	2-6	2-6	2-6	5	14	77
4. When there are two vowels, one of which is final e, the first vowel is long and the e is silent.	2-6	2-6	2-6	2-6	2-6	2-6	6	30	63
5. The r gives the preceding vowel a sound that is neither long nor short.	2-6	3-6	2-6	2-6	2-6	2-6	5	29	86

TABLE 11--Continued

Generalization	Maintenance of Generalization in the Series by Grades						Summary		Per Cent of Applicability
	Series A	Series B	Series C	Series D	Series E	Series F	Number of Series	Number of Texts	
6. The first vowel is usually long and the second silent in the digraphs ai, ea, oa, and ui.									
ai	(2-6)	(2-6)	(2,3, 5,6)	(2-6)	(2-6)	(2-6)	6	29	(74)
ea	(2-5)	(2-6)	(2-6)	(2-6)	(2,5,6)	(2-6)	6	27	(53)
oa	(2-6)	(3-6)	(2-6)	(2-6)	(3)	(2-6)	6	25	(95)
ui	(4-6)	(. .)	(4)	(. .)	(3,4)	(. .)	3	6	(5)
7. In the phonogram ie, the i is silent and the e has a long sound.	4-6	5,6	4,5	. .	2-6	3,4,6	5	15	14
8. Words having double e usually have the long e sound.	2-6	2-6	2-6	4-6	2-6	2-6	6	30	86

TABLE 11--Continued

Generalization	Maintenance of Generalization in the Series by Grades						Summary		Per Cent of Applicability
	Series A	Series B	Series C	Series D	Series E	Series F	Number of Series	Number of Texts	
9. When words end with silent e, the preceding a or i is long.	2-6	2-6	2-6	2-6	2-6	2-6	6	30	58
10. In ay the y is silent and gives a its long sound.	2-6	2-6	2,3	3,5	2-6	2-6	6	25	83
11. When the letter i is followed by the letters gh, the i usually stands for its long sound and the gh is silent.	3-6	3-6	3-6	3-6	2-5	2,3, 5,6	6	22	68
12. When a follows w in a word, it usually has the sound a as in was.	2,3	. .	3	. .	. .	2,3, 5,6	2	7	22

TABLE 11--Continued

Generalization	Maintenance of Generalization in the Series by Grades						Summary		
	Series A	Series B	Series C	Series D	Series E	Series F	Number of Series	Number of Texts	Per Cent of Applicability
13. When e is followed by w, the vowel sound is the same as represented by oo.	2-6	6	3	4	2-6	3-6	6	17	42
14. The two letters ow make the long o sound.	2-4	2-5	2-4 6	3,6	2-6	2,3,6	6	21	54
15. W is sometimes a vowel and follows the vowel digraph rule.	2-6	2-6	2,4	. .	. .	2-6	4	17	37
16. When y is the final letter in a word, it usually has a vowel sound.	2-6	4,5	2-4	. .	2-6	2-6	5	20	86
17. When y is used as a vowel in words, it sometimes has the sound of long i.	2-6	4,5	2,6	. .	. .	3,4,6	4	12	10

TABLE 11--Continued

Generalization	Maintenance of Generalization in the Series by Grades						Summary		Per Cent of Applicability
	Series A	Series B	Series C	Series D	Series E	Series F	Number of Series	Number of Texts	
18. The letter a has the same sound (ô) when followed by l, w, and u.	2-6	. .	2	. .	2-6	2-6	4	16	35
19. When a is followed by r and final e, we expect to hear the sound heard in care.	4,5	6	2,3	. .	. .	4	4	6	96
20. When c and h are next to each other, they make only one sound.	2-5	3-6	3-5	3-6	. .	2-5	5	19	100
21. Ch is usually pronounced as it is in kitchen, catch, and chair, not like sh.	2-5	6	3-5	3-6	. .	2-5	5	16	85
22. When c is followed by e or i, the sound of s is likely to be heard.	3-6	3-6	3-6	4-6	2-6	2-5	6	24	86

TABLE 11--Continued

Generalization	Maintenance of Generalization in the Series by Grades						Summary		Per Cent of Applicability
	Series A	Series B	Series C	Series D	Series E	Series F	Number of Series	Number of Texts	
23. When the letter c is followed by o or a, the sound of k is likely to be heard.	2-4 6	2-6	2-4 6	5,6	. .	2-6	5	20	100
24. The letter g often has a sound similar to that of j in jump when it precedes the letters i or e.	4-6	3-6	2,4, 6	5,6	4-6	3-6	6	22	80
25. When ght is seen in a word, gh is silent.	. .	4	3	3,6	2-6	. .	4	9	100
26. When a word begins kn, the k is silent.	3,5	2-6	3,5	2,4, 5	2-6	2-6	6	22	100
27. When a word begins with wr, the w is silent.	3,6	4	3,5	6	2-6	3-6	6	15	100

TABLE 11--Continued

Generalization	Maintenance of Generalization in the Series by Grades						Summary		Per Cent of Applicability
	Series A	Series B	Series C	Series D	Series E	Series F	Number of Series	Number of Texts	
28. When two of the same consonants are side by side, only one is heard.	2,3 6	6	2,4, 5	2-6	2-6	4	6	18	90
29. When a word ends in ck, it has the same last sound as in look.	3,4	2-6	2-4	. .	. .	. .	3	10	100
30. In most two-syllable words, the first syllable is accented.	4,6	. .	. .	. .	. .	. .	1	2	82
31. If a, in, re, ex, de, or be is the first syllable in a word, it is usually unaccented.	6	2	5	. .	. .	3-6	4	7	81

TABLE 11--Continued

Generalization	Maintenance of Generalization in the Series by Grades						Summary		Per Cent of Applicability
	Series A	Series B	Series C	Series D	Series E	Series F	Number of Series	Number of Texts	
32. In most two-syllable words that end in a consonant followed by y, the first syllable is accented and the last is unaccented.	. .	. .	3,5	. .	. .	. .	1	2	98
33. One vowel letter in an accented syllable has its short sound.	5	4	5	. .	. .	2-6	4	8	68
34. When y or ey is seen in the last syllable that is not accented, the long sound of e is heard.	. .	. .	. .	. .	2-6	. .	1	5	00
35. When ture is the final syllable in a word, it is unaccented.	. .	. .	. .	. .	3,6	3	2	3	100

TABLE 11--Continued

Generalization	Maintenance of Generalization in the Series by Grades						Summary		Per Cent of Applicability
	Series A	Series B	Series C	Series D	Series E	Series F	Number of Series	Number of Texts	
36. When tion is the final syllable in a word, it is unaccented.	4-6	. .	5	. .	. .	4-6	3	7	100
37. In many two- and three syllable words, the final e lengthens the vowel in the last syllable.	. .	. .	. .	. .	. .	. .	0	0	49
38. If the first vowel sound in a word is followed by two consonants, the first syllable usually ends with the first of the two consonants.	3-6	2-6	2-6	3-6	2-6	2-6	6	28	80

TABLE 11--Continued

Generalization	Maintenance of Generalization in the Series by Grades						Summary		Per Cent of Applicability
	Series A	Series B	Series C	Series D	Series E	Series F	Number of Series	Number of Texts	
39. If the first vowel sound in a word is followed by a single consonant, that consonant usually begins the second syllable.	3-6	. .	. .	5	3-6	. .	3	9	49
40. If the last syllable of a word ends in le, the consonant preceding the le usually begins the last syllable.	4-6	. .	3,4	6	. .	2,3, 5,6	4	10	96
41. When the first vowel element in a word is followed by th, ch, or sh, these symbols are not broken when the word is divided into syllables and may go with either the first or second syllable.	3,5	. .	4	. .	. .	3,4	3	5	68

TABLE 11--Continued

Generalization	Maintenance of Generalizations in the Series by Grades						Summary		Per Cent of Applicability
	Series A	Series B	Series C	Series D	Series E	Series F	Number of Series	Number of Texts	
42. In a word of more than one syllable, the letter v usually goes with the preceding vowel to form a syllable.	3,5	. .	4	. .	. .	3,4	3	5	68
43. When a word has only one vowel, the vowel sound is likely to be short.	2-6	2-6	2	2-6	2-6	2,3	6	23	67
44. When there is one e in a word that ends in a consonant, the e usually has a short sound.	2-6	2-6	2-6	2-6	2-6	2-6	6	30	91

TABLE 11--Continued

Generalization	Maintenance of Generalizations in the Series by Grades						Summary		Per Cent of Applicability
	Series A	Series B	Series C	Series D	Series E	Series F	Number of Series	Number of Texts	
45. When the last syllable is the sound r, it is unaccented.	2-6	. .	. .	. .	. .	. .	1	5	82

[a]Series A--Spell Correctly, Grades 2-6, c 1968 General Learning Corporation. Used by permission of Silver Burdett Company.

Series B--Spelling and Writing Patterns, Grades 2-6, c 1968 Follett Publishing Company. Used by permission. Although a study was made of this word list, the program itself does not use phonics generalizations commonly used in other programs in spelling. A linguistic approach is used.

Series C--Basic Keys to Spelling, Grades 2-6, c 1967 J. B. Lippincott Company. Used by permission.

Series D--Spelling, Grades 2-6, c 1965 Ginn and Company. Used by permission.

Series E--Spellingtime, Grades 2-6, c 1964 The L. W. Singer Company/ A Division of Random House, Inc. Used by permission.

Series F--Spelling Growth, Grades 2-6, c 1967 The Economy Company. Used by permission.

[b]Figures in parentheses indicate specific applications of the generalization.

twenty-four, and twenty spellers. One generalization with eighty-three per cent applicability was maintained in twenty-five textbooks; and six generalizations with percentages of applicability ranging from eighty to eighty-five in two to twenty-eight spellers. After being omitted altogether in the textbooks for one series, one generalization with a per cent of applicability of seventy-seven was maintained in fourteen spellers among the remaining five series. Seven generalizations with percentages of applicability between fifty and seventy-four were maintained in at least five to twenty spellers each.

Highest maintenance in the series for ten generalizations that showed individual percentages of applicability less than fifty occurred as follows: one in all thirty spellers, two in seventeen, one in sixteen, one in fifteen, and one in twelve textbooks. The remaining four generalizations were maintained in less than seven spellers each. Specific applications one and two for Generalization Two were presented in thirty spellers each; application three for this generalization was maintained in twenty spellers. Relative to specific applications for Generalization Six, the first one was maintained in twenty-nine textbooks, the second in twenty-seven, the third in twenty-five, and the fourth in six spellers.

In keeping with the selection criterion at least seven of the forty-five phonic generalizations were introduced and

maintained in depth in each of the six series. Actual maintenance of the generalizations in the series was as follows: fifteen in Series A; thirteen in Series B; seven in Series C; nine in Series D; twenty-two in Series E; and sixteen in Series F.

Comparison of Per Cent of Applicability of Generalizations to Spelling and Reading Programs

Since the same generalizations, procedures, and criteria of degree of applicability were employed in the Clymer[1] study, the Bailey[2] study, and this study, a suitable basis was established for comparison of relative percentages of applicability of the forty-five phonic generalizations to reading and to spelling programs. For the spelling programs, a group of twenty-six of the generalizations met or exceeded the criterion of degree of applicability of seventy-five per cent. In his investigation, Clymer found that twenty-three of the generalizations from this group met or exceeded the criterion of applicability when they were applied to a composite word list drawn from primary reading programs. Bailey found that all twenty-six of these generalizations met or exceeded the criterion of applicability when they were applied to the composite word list compiled from primary and intermediate reading programs. These twenty-six generalizations

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[1]Clymer, op. cit., pp. 252-258.

[2]Bailey, op. cit., pp. 413-418.

were the only ones that met the criterion of applicability to any one of the composite vocabularies. The number, statement of the generalization, and the per cent of applicability obtained for these generalizations are reported in Table 12 for each of the three studies.

Comparisons of Percentages of Applicability to the Three Programs

Eight generalizations were equal in per cent of applicability to the two reading programs and the spelling programs. Another four generalizations showed a higher per cent of applicability to the spelling programs than to the reading programs. Five generalizations had higher percentages of applicability to the two reading than to the spelling programs. Results of the comparison of per cent of applicability for the remaining nine generalizations either favored one or the other reading program over the spelling programs or the spelling programs over one or the other of the reading programs.

The composite word list for primary-intermediate readers and the one for the selected spelling programs were compiled from the textbooks for grades one through six and two through six, respectively, and contained more words than did the composite word list for just primary readers. Since the relationship between per cent of applicability and total number of applicable words or incidents and number of conformations is a direct one for the generalizations, larger percentages of applicability were expected for this group of

TABLE 12

COMPARISON OF APPLICABILITY OF PHONIC GENERALIZATIONS TO SPELLING AND READING PROGRAMS

Generalization	Per Cent of Applicability[a]		
	Primary Readers (Clymer)	Primary and Intermediate Readers (Bailey)	Elementary School Spelling Programs
3. If the only vowel letter is at the end of a word, the letter usually stands for a long sound.	74	76	77[b]
5. The r gives the preceding vowel a sound that is neither long nor short.	78	86	86
8. Words having double e usually have the long e sound.	98	87	86
10. In ay the y is silent and gives a its long sound.	78	88	83
16. When y is the final letter in a word, it usually has a vowel sound.	84	89	86
19. When a is followed by r and final e, we expect to hear the sound heard in care.	90	96	96

TABLE 12--Continued

Generalization	Per Cent of Applicability		
	Primary Readers (Clymer)	Primary and Intermediate Readers (Bailey)	Elementary School Spelling Programs
20. When c and h are next to each other, they make only one sound.	100	100	100[c]
21. Ch is usually pronounced as it is in kitchen, catch, and chair, not like sh.	95	87	85
22. When c is followed by e or i, the sound of s is likely to be heard.	96	92	86
23. When the letter c is followed by o or a, the sound of k is likely to be heard.	100	100	100[c]
24. The letter g often has a sound similar to that of j in jump when it precedes the letters i or e.	64	78	80
25. When ght is seen in a word, gh is silent.	100	100	100[c]

TABLE 12--Continued

Generalization	Per Cent of Applicability		
	Primary Readers (Clymer)	Primary and Intermediate Readers (Bailey)	Elementary School Spelling Programs
26. When a word begins kn, the k is silent.	100	100	100[c]
27. When a word begins with wr, the w is silent.	100	100	100[c]
28. When two of the same consonants are side by side only one is heard.	99	98	90
29. When a word ends in ck, it has the same last sound as in look.	100	100	100[c]
30. In most two-syllable words, the first syllable is accented.	85	81	82
31. If a, in, re, ex, de, or be is the first syllable in a word, it is usually unaccented.	87	84	81
32. In most two-syllable words that end in a consonant followed by y, the first syllable is accented and the last is unaccented.	96	97	99[b]

TABLE 12--Continued

Generalization	Per Cent of Applicability		
	Primary Readers (Clymer)	Primary and Intermediate Readers (Bailey)	Elementary School Spelling Programs
35. When ture is the final syllable in a word, it is unaccented.	100	95	100
36. When tion is the final syllable in a word, it is unaccented.	100	100	100[c]
38. If the first vowel sound in a word is followed by two consonants, the first syllable usually ends with the first of the two consonants.	72	78	80[b]
40. If the last syllable of a word ends in le, the consonant preceding the le usually begins the last syllable.	97	93	96
41. When the first vowel element in a word is followed by th, ch, or sh, these symbols are not broken when the word is divided into syllables and may go with either the first or second syllable.	100	100	100[c]

TABLE 12--Continued

Generalization	Per Cent of Applicability		
	Primary Readers (Clymer)	Primary and Intermediate Readers (Bailey)	Elementary School Spelling Programs
44. When there is one e in a word that ends in a consonant, the e usually has a short sound.	76	92	91
45. When the last syllable is the sound r, it is unaccented.	95	79	82

[a]The per cent of applicability is reported if the generalization meets the criterion for applicability to any one of the three composite vocabularies.

[b]A larger per cent of applicability was obtained for spelling programs.

[c]An equal per cent of applicability was obtained for both spelling and reading programs.

generalizations when they were applied to larger numbers of words. In order to check this expectation, separate comparisons were made between the findings of applicability to spelling programs with those for primary reading programs and those for primary-intermediate reading programs. The results showed that between primary reading programs and the spelling programs percentages of applicability for the twenty-six generalizations were even for nine, higher in the primary reading programs for eight, and higher in the spelling programs for nine. Between the primary-intermediate reading programs and the spelling programs, percentages of applicability for the generalizations were even for ten, higher in the primary-intermediate reading programs for eight, and higher in the spelling programs for eight. The ranges of percentage points of difference in the two comparisons extended from one to sixteen between the primary reading programs and the spelling programs and one to eight between the primary-intermediate reading programs and the spelling programs.

Comparison Relative to Classification

Analysis of the twenty-six generalizations that were selected for comparison of percentages of applicability to reading and spelling programs revealed the following four classifications for them: (1) generalizations related to vowel sounds as they occur in words (a) internally, (b) as

final letter in a word, and (c) as affected by the consonant r; (2) sound of (a) single consonants c, k, and g, and (b) consonant elements and speech sounds ch, ck, ght, kn, sh, th, and wr; (3) sound of vowels in accented and unaccented syllables; and (4) syllabic division involving two consonants together and the word element le. The four classifications are related to the three programs in the following paragraphs.

All vowel sounds were represented in spelling the words contained in the composite word list, and in many ways; for example, as a single vowel, as ay, as y the final letter in a word, and in accented and unaccented syllables. When there was just one vowel in a word, position controlled its sound as is demonstrated by the statement of Generalizations Three and Forty-four. The long e sound for double ee showed a higher percentage of applicability to the vocabulary of reading programs than it did to the composite vocabulary for spelling programs. The vowel digraph ay occurred in fewer than one hundred words in each of the three programs; however, y occurred as the final letter in a word in much larger numbers in the three programs. As a consequence, per cent of applicability was greater in the programs for the generalization that related to final y than it was for the generalization that related to the vowel digraph ay.

Generalizations Five and Nineteen related to vowel sounds when they are affected by the consonant r. Experience

in pronouncing these sounds in reading seemed to provide a background that was beneficial to spelling. Comparison of the applicability of the two generalizations to reading and to spelling programs showed that there was an eight percentage point difference between primary reading programs and the spelling programs. But per cent of applicability of the two generalizations to primary and intermediate reading programs and to spelling programs was even.

Most of the consonant letters in the English language have their own distinct sound. Nevertheless, the consonants c and g often have sounds similar to other consonants. These sounds sometimes generate spelling problems. Comparison of the per cent of applicability of Generalizations Twenty-two and Twenty-three which related to sounds for the consonant c showed that they applied almost equally as well to spelling programs as to reading programs. Generalization Twenty-four related to the letter g and was below seventy-five in per cent of applicability to primary readers, but it was well above this figure in its applicability to primary and intermediate readers and to the selected spelling programs.

Consonant digraphs referred to in Generalizations Twenty-five, Twenty-six, Twenty-seven and Forty-one were even in their per cent of applicability to reading and to spelling programs. Maximum percentages of applicability were shown for these four generalizations in each of the three programs.

As shown by the high levels of applicability of Generalizations Thirty, Thirty-one, and Thirty-two to the three programs, vowel generalizations usually are consistent in applying to two-syllable words. However, this consistency was found to drop sharply when the vowel principles were applied to words of more than two syllables and to words that contained both primary and secondary accented syllables. Generalization Thirty-three which did not meet the criterion of degree of applicability is a good illustration of this observation.

As pronunciable units in words, syllables contain at least one vowel sound either alone or combined with one or more consonants. The ability to syllabicate words and to identify sound-letter relationships in the syllables is a valuable economy to both reading and spelling as was demonstrated by the utility of Generalizations Thirty-eight and Forty to each of the three programs.

CHAPTER IV

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

Studies of the applicability of forty-five phonic generalizations to reading programs were extended in this study to include selected spelling programs.[1] Introduction and maintenance of the phonic generalizations in the selected spelling programs were determined as a second aspect of the study. A third aspect consisted of a comparison of the applicability of specific phonic generalizations to spelling and reading programs.

After careful consideration, limited basic assumptions were formulated and criteria were evolved for the selection of basic spelling series to be studied. Written correspondence with six textbook publishers established authorization to use the word lists for grades two through six in their

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[1]Dr. Theodore Clymer, Dr. Mildred Hart Bailey, and the International Reading Association granted permission to the researcher to quote from and to use generalizations, procedures, criteria, and data reported as follows: Theodore Clymer, "The Utility of Phonic Generalizations in the Primary Grades," Reading Teacher, XVI (January, 1963), 252-258; Mildred Hart Bailey, "The Utility of Phonic Generalizations in Grades One through Six," Reading Teacher, XX (February, 1967), 413-418.

spelling programs in the study. A composite word list of 5,431 words was drawn from the spelling lists that were presented in the thirty textbooks that constituted the six series. Control of the composite word list was effected by reasonable restrictions that are listed in Chapter II.

Separate lists of words showing the diacritical markings, syllabic divisions and accentuations were compiled from the composite word list for the investigation of applicability of each of the forty-five phonic generalizations. The applicability of each generalization was then determined by using the appropriate list; Webster's New Collegiate Dictionary, 1961 edition, was the authority for the pronunciation, syllabication and accentuation of all words. Every word on each list was identified as either a conformation of or exception to the generalization under investigation. A per cent of applicability was computed for each generalization by dividing the number of words or incidents that conformed to the generalization by the total number of words or incidents investigated for the applicability of the generalization. The findings are summarized below.

The spelling lists contained words from the entire range of the elementary school curriculum--science, history, geography, mathematics, music, foreign language, and even hobbies, sports, and entertainment. Many of the subject-related or technical words did not fit into the phonological structure and/or patterning order which governed the spelling

word lists; consequently, exceptions to the generalizations were frequent among these words.

Investigation of the applicability of each of the forty-five phonic generalizations to the composite word list revealed percentages of applicability that ranged from zero to one hundred. Twelve of the twenty-six vowel generalizations were introduced in grade two in every series, but the majority of these generalizations did not meet the criterion of seventy-five per cent applicability. Consonant generalizations were not introduced before grade three in any series, but they more consistently met the criterion of applicability than did the vowel generalizations. A lack of consistency was noted in the six series relevant to the introduction and maintenance of generalizations that related to syllabication and accentuation. For example, one generalization related to syllabication was introduced in grade two or three in all six series, but another generalization pertaining to syllabication was presented in one series in grade six only. Neither one of the two generalizations was maintained in each of the thirty textbooks. Three generalizations that related to accentuation were introduced in grade two in four series; five more accent generalizations were introduced above grade two in one to four series. None of these eight generalizations was maintained in depth in any of the series. Generalizations that applied to <u>-ture</u> and <u>-tion</u> were generally neglected in the series.

The same criterion of degree of applicability was employed for investigation of the composite word lists for the two reading programs and the one for the spelling programs; also, the same group of generalizations met this criterion in each of the three investigations. Comparison of the individual percentages of applicability to reading programs and to spelling programs for this group of generalizations showed that the percentages were relatively similar in each program. The greater similarity of per cent of applicability occurred between the primary-intermediate reading programs and the selected spelling programs. The range of differences in percentage points was from one to eight for these two programs. The differences in percentage points between the primary reading programs and the selected spelling programs ranged from one to thirteen. Research studies on spelling vocabulary conducted by Fitzgerald, Greene, Horn, Rinsland, and Thorndike[1] supplied a majority of the words for the spelling lists, with words from the Rinsland study included in five of the series. Since authors of readers commonly utilize words from the same vocabulary studies, the possibility exists that similarities

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[1]James A. Fitzgerald, A Basic Life Spelling Vocabulary (Milwaukee: Bruce Publishing Company, 1951); Harry A. Greene, The New Iowa Spelling Scale (Iowa City: University of Iowa, 1955); Ernest Horn, A Basic Writing Vocabulary (Iowa City: University of Iowa, 1927); H. D. Rinsland, A Basic Vocabulary of Elementary School Children (New York: Macmillan Company, 1945); Edward L. Thorndike, The Teacher's Word Book (New York: Teachers College, Columbia University, 1921).

in per cent of applicability of the phonic generalizations to reading programs and to the spelling programs are the result of this practice.

Grouping of the forty-five phonic generalizations relative to their applicability to the composite word list revealed that several of them were useful in providing clues for pronouncing and spelling words. For example, nine generalizations showed one hundred per cent applicability to the composite spelling list, and percentages of applicability ranging from seventy-seven to ninety-nine were obtained for seventeen more of the generalizations. However, the percentages of applicability obtained for the nineteen generalizations that did not meet the criterion of applicability were low enough to raise questions about their utility to spelling programs.

Arrangement of the phonic generalizations according to number of applicable words or incidents showed that one thousand or more words occurred for six generalizations, and that less than two hundred words occurred for twenty-four more of the generalizations, twelve of which had less than one hundred applicable words. The number of applicable words for a generalization is a factor to be considered in addition to its per cent of applicability. Inclusion in spelling programs of phonic generalizations for which there are small numbers of words may be questioned relative to their contribution.

Prefixes and suffixes which constituted separate syllables occurred in several hundred multi-syllabic words. Phonetic elements in these affixes usually adhered to the related phonic generalizations, but phonetic elements in other parts of these words often did not lend themselves to the phonic generalizations.

Because of the enormity of the task of learning to spell the 5,431 words contained in the composite vocabulary, application of some of the forty-five phonic generalizations as spelling aids was useful in terms of per cent of applicability and number of relevant words. However, the findings of applicability for others cast a doubt upon their usefulness to pronunciation and correct spelling.

Conclusions

On the basis of the findings of this investigation of the forty-five phonic generalizations, the following conclusions are reached:

1. The high percentage of overlap in the vocabulary used for reading and that used for spelling indicates that phonic instruction in reading and in spelling should be coordinated.

2. Because phonic generalizations are linguistically oriented, they apply in greater numbers to spelling lists that are organized on the basis of sound-letter relationship such as that introduced in the series identified as A, E, and F in Table 11.

3. Phonic generalizations related to single consonants, consonant elements, and pronunciation of vowels in accented syllables show substantial percentages of applicability to spelling programs; consequently, their inclusion in spelling programs is defensible.

4. Phonic generalizations apply more consistently to prefixes and suffixes which are separate syllables in multi-syllabic words than they do to other parts of these words. A contribution could be made to spelling programs by identifying phonic generalizations which apply equally as well to prefixes, suffixes, and inner syllables of multi-syllabic words.

5. The inconsistent introduction and maintenance of generalizations related to syllabic division and accentuation clearly indicate that the potential contributions of generalizations should be given careful consideration.

6. The probability of sustained correct spelling resulting from utilization of the nineteen phonic generalizations that have individual percentages of applicability less than seventy-five is questionable. For example, only 5,755 conformations were found for the 11,990 words or incidents on the nineteen lists used to determine the applicability of these generalizations. Furthermore, a higher per cent of applicability than seventy-five for all phonic generalizations applied to spelling programs would substantially increase probability of correct spelling. Such a higher per cent of

applicability should be considered as a criterion of applicability for phonic generalizations.

7. The absence of a minimum per cent of applicability for fourteen of the twenty generalizations that apply to short and long vowels, vowel digraphs, and vowel sounds affected by l, w, u, and r is significant, and research should be undertaken to develop generalizations of higher applicability to replace them. Pronunciation and spelling of mono-syllabic words which are important to grades two and three could be improved by such an undertaking.

8. The findings of per cent of applicability for the phonic generalizations as a whole indicate that they are only moderately useful to spelling.

Recommendations

The conclusions based upon this research indicate that application of phonic generalizations to spelling programs as aids to correct spelling should receive further study and consideration. Upon the basis of this inference, the following recommendations are made:

1. Research is recommended which will produce scientifically derived and phonetically-linguistically oriented criteria for judging the usefulness of phonic generalizations to spelling programs.

2. The findings of applicability to spelling programs of the forty-five phonic generalizations revealed a

serious lack of usefulness for several of the generalizations that related to vowel sounds in words and in accented syllables. Further evaluation is recommended for generalizations that relate to vowels and vowel elements in words and in accented syllables. Specifically, generalizations numbered 6, 7, 9, 13, 16, 33, 34, and 37 should be restated when they are applied to spelling programs.

3. Application of the forty-five phonic generalizations to a larger number of spelling programs, and, perhaps, to spelling programs for grades seven and eight, is recommended for further evaluation of their applicability to spelling programs.

4. As many subject or technical words do not fit into the phonics structure and/or word patterns utilized by newer spelling programs, additional evaluation is suggested relevant to the applicability of the phonic generalizations to the vocabulary of content areas such as science, social studies, and mathematics.

5. Since written communication requires the use of many words that are not included in spelling word lists, correct spelling of these words depends in part upon ability to generalize regarding sound-letter relationships. In view of this necessity, evaluation of the applicability of the phonic generalizations is suggested relative to a composite vocabulary drawn from children's written work.

6. Investigation of the applicability of phonic generalizations to spelling programs developed or revised since 1963 should be conducted upon the basis of a more recently published dictionary of authority, or, perhaps, upon the basis of more than one dictionary of authority.

7. Because of the heavy reliance upon phonics knowledge exhibited by the newer spelling programs, recommendation is made for future research that evolves a general computer language which makes it possible to computer program studies of the applicability of phonic generalizations.

8. Research should be undertaken to determine the influence of knowledge of spelling generalizations upon the spelling behavior of individuals.

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APPENDIX A

LIST OF THE FORTY-FIVE PHONIC GENERALIZATIONS UTILIZED IN THE STUDY

1. When there are two vowels side by side, the long sound of the first one is heard and the second is usually short.

2. When a vowel is in the middle of a one-syllable word, the vowel is short.

middle letter

one of the middle two letters
in a word of four letters

one vowel within a word of
more than four letters

3. If the only vowel letter is at the end of a word, the letter usually stands for a long sound.

4. When there are two vowels, one of which is final e, the first vowel is long and the e is silent.

5. The r gives the preceding vowel a sound that is neither long nor short.

6. The first vowel is usually long and the second silent in the digraphs ai, ea, oa, and ui.

ai

ea

oa

ui

7. In the phonogram ie, the i is silent and the e has a long sound.

8. Words having double e usually have the long e sound.

9. When words end with silent e, the preceding a or i is long.

10. In ay the y is silent and gives a its long sound.

11. When the letter i is followed by the letters gh, the i usually stands for its long sound and the gh is silent.

12. When a follows w in a word, the a usually has the sound of a as in was.

13. When e is followed by w, the vowel sound is the same as represented by oo.

14. The two letters ow make the long o sound.

15. W is sometimes a vowel and follows the vowel digraph rule.

16. When y is the final letter in a word, it usually has a vowel sound.

17. When y is used as a vowel in words, it sometimes has the sound of long i.

18. The letter a has the same sound (ô) when followed by l, w, and u.

19. When a is followed by r and final e, we expect to hear the sound heard in care.

20. When c and h are next to each other, they make only one sound.

21. Ch is usually pronounced as it is in kitchen, catch, and chair, not like sh.

22. When c is followed by e or i, the sound of s is likely to be heard.

23. When the letter c is followed by o or a, the sound of k is likely to be heard.

24. The letter g often has a sound similar to that of j in jump when it precedes the letter i or e.

25. When ght is seen in a word, gh is silent.

26. When a word begins kn, the k is silent.

27. When a word begins with wr, the w is silent.

28. When two of the same consonants are side by side, only one is heard.

29. When a word ends in ck, it has the same last sound as in look.

30. In most two-syllable words, the first syllable is accented.

31. If a, in, re, ex, de, or be is the first syllable in a word, it is usually unaccented.

32. In most two-syllable words that end in a consonant followed by y, the first syllable is accented and the last is unaccented.

33. One vowel letter in an accented syllable has its short sound.

34. When y or ey is seen in the last syllable that is not accented, the long sound of e is heard.

35. When ture is the final syllable in a word, it is unaccented.

36. When tion is the final syllable in a word, it is unaccented.

37. In many two- and three-syllable words, the final e lengthens the vowel in the last syllable.

38. If the first vowel sound in a word is followed by two consonants, the first syllable usually ends with the first of the two consonants.

39. If the first vowel sound in a word is followed by a single consonant, that consonant usually begins the second syllable.

40. If the last syllable of a word ends in le, the consonant preceding the le usually begins the last syllable.

41. When the first vowel element in a word is followed by th, ch, or sh, these symbols are not broken when the word is divided into syllables and may go with either the first or second syllable.

42. In a word of more than one syllable, the letter v usually goes with the preceding vowel to form a syllable.

43. When a word has only one vowel letter, the vowel sound is likely to be short.

44. When there is one e in a word that ends in a consonant, the e usually has a short sound.

45. When the last syllable is the sound r, it is unaccented.

APPENDIX B

THE COMPOSITE VOCABULARY

a
abandon
abbreviation
able
aboard
about
above
abroad
abrupt
absence
absent
absolutely
absorb
absorption
abstract
abundance
abundant
accent
accept
accepted
accident
acclimate
accomplish
according
account
accurate
accuracy
accusation
accuse
accustomed
ache
acid
acorns
acoustics
acquainted
acre
across
act
acted
action
active
actively
activity
actor
adapt
add
addition
additional
address
adhesion
adjective
adjoin
adjourn
adjust
admiration
admire
admirer
admission
admit
adopt
adopted
adoption
adore
adorn
advance
advantage
advantageous
adventure
adventurous
adverb
advice
advise
advocate
afar
affect
affection
afford
afraid
aft
after
afternoon
afterward
again
against
agate
age
agent
ago
agree
agreeable
agreeing
agreement
ahead
aid
aim
air
aircraft
airmail
airplane
airport
aisle
alarm
alas
alfalfa

alga
algae
align
alike
alive
all
alley
alloy
allow
allowance
all right
alluvial
almanac
almost
aloft
alone
along
aloud
alphabet
already
also
altar
alter
alternate
although
altitude
alto
altogether
aluminum
always
am
ambition
amble
amend
amendments
amoeba
among
amount
amphibian
ample
amplifier
amuse
amusement
amusing
an
ancient
and
anemometer
aneroid
angel
anger
angle
angleworm
angrier
angrily
angry
animal
animation
ankle
announce
announcer
annoy
annual
annually
another
answer
answering
ant
anteater
antenna
anther
anthracite
antibiotic
antimony
antiseptic
anxiety
anxious
anxiously
any
anybody
anyhow
anyone
anything
anyway
anywhere
apart
apartment
ape
apologize
apparatus
appeal
appear
appearance
applaud
apple
apply
appoint
appointment
appreciate
appreciation
approve
apricots
April
apron

aquarium
aqueous
arboreal
architecture
are
area
argue
argument
arid
arise
arithmetic
armistice
arm
armies
army
arose
around
arouse
arrange
arrangement
arrest
arrival
arriving
arrow
arsenal
art
arteries
artesian
articles
artificial
artist
as
asbestos
ashamed
ashen
ashes
aside
ask
asking
asleep
assemblies
assembly
assign
assignment
assist
assistance
assistant
associate
association
associative
astonish
astounded
astronomer
at
ate
athlete
athletic
atmosphere
atom
atomic
attach
attachment
attack
attain
attempt
attend
attendance
attention
attic
attitude
attractive
attractively
auburn
auctioneer
audience
audio-visual
auditorium
auditory
August
aunt
auricle
author
authority
authorize
authorship
autograph
automat
automatic
automobile
autonomic
autos
autumn
available
avalanches
avenue
average
aviation
aviator
avoid
avoiding
await
awake
away
awful

awfully
awhile
awkward
awning
awoke
ax
axis
axle
azure
babies
baby
back
background
backward
bacon
bacteria
bad
badge
badly
bag
bait
baiting
bake
bakery
balance
balancing
balcony
bald
balk
ball
balloon
balsa
band
bandage
bang
bank
banker
banking
banner
bar
bare
barge
barn
barometer
barrel
barren
barrier
base
baseball
basement
basin
basket
basketball
bass
bass
bat
bath
bathing
bathroom
battery
batteries
battle
bay
be
beach
beacon
bead
bean
bear
beard
beast
beat
beautiful
beauty
beaver
became
because
beckon
become
becoming
bed
bedroom
bedtime
bee
beef
been
beet
beetle
before
befriend
beg
began
begging
begin
beginner
begun
behave
behavior
behind
behold
being
belief
believe
believer

bell
belong
below
belt
bench
benches
bend
beneath
benefit
bent
berries
berry
berth
beside
best
bet
betray
better
betting
between
beware
biannually
bicycle
bicycling
biennial
big
bigger
biggest
bight
bike
bill
billion
bind
birth
birthday
bisect
bit
bite
biting
bitten
bitter
bitterest
bitterly
bituminous
black
blackberry
blackbird
blackboard
blacker
blackest
blade
blame
blank
blanket
blast
blaze
blazing
bleaching
bleak
bleeding
bless
blew
blind
blindness
blink
blinking
blister
blithe
blizzard
block
blood
bloodhound
bloodshed
bloodstain
bloody
bloom
blooming
blossom
blouse
blow
blown
blue
blue jay
blustery
board
boast
boat
bodies
body
boil
bold
boll weavil
bolt
bomb
bombard
bone
bonfire
book
bookish
bookkeeper
bookkeeping
booklet
boom
boost

boot
booth
border
bored
born
borrow
boss
botanist
botany
both
bother
bottle
bottom
bough
bought
boulder
bounce
bound
boundaries
boundary
bout
bow
bow
bowl
box
boxes
boy
brag
braid
brain
brake
branch
branches
brave
braver
bravely
bray
bread
breadth
break
breaking
breakdown
breakfast
breast
breathe
breathing
breeze
brick
bridge
brief
bright
brighten
brighter
brightly
brim
bring
bringing
broke
broken
bronco
brook
broom
brother
brought
brow
brown
bruise
brush
brushes
brushing
bubble
bucket
bud
budge
budget
buffalo
bug
buggy
bugle
build
builder
building
built
bulb
bull
bump
bun
bunch
bundle
bunk
bunny
bunt
buoy
buoyancy
burden
buried
buries
burn
burnt
burro
burst
bury
bus
buses

bush
bushel
bushes
busier
busiest
busy
busybody
but
butcher
butter
butterflies
butterfly
button
buttonhole
buy
buying
buzz
by
cab
cabbage
cabin
cabinet
caboose
cactus
cafeteria
cage
cake
calendar
calf
call
calling
calm
calves
came
camel
camera
camp
camper
can
canal
canary
cancel
candies
candle
candy
cane
cannery
cannon
cannot
canoe
canyon
cap
cape
capillaries
capital
capitol
captain
capture
capturing
car
caravan
carbine
carbohydrates
carbon dioxide
carburetor
card
cardboard
care
career
careful
carefully
careless
cargo
caribou
caring
carnival
carol
carpenter
carpet
carport
carriage
carried
carries
carrots
carry
carrying
cart
cartilage
carton
cartoon
cartridge
carve
case
cash
casting
castle
casual
cat
catalog
catalogue
catalpa
catch
catches
caterpillar

cattle
caught
cause
cave
cease
ceiling
celebrate
celebrated
cell
cellar
cellulose
cement
cemetery
center
central
century
cereals
cerebellum
cerebrum
certain
certainly
chain
chair
chalk
chalky
chance
change
changing
channel
chant
character
charcoal
charged
charging
charming
chart
chase
chasing
cheap
check
checkers
cheek
cheer
cheerful
cheerfulness
cheering
cheerless
cheese
chef
chemical
chemist
cherish
cherries
cherry
chest
chew
chicken
chicks
chief
chiefly
child
childish
children
chill
chilly
chimney
chin
chip
chipmunk
chirp
chocolate
choice
choke
choose
choosing
chop
chopper
chopping
chopsticks
choral
chore
choruses
chose
chosen
chromium
chromosome
chuckle
chug
chunk
church
churches
churn
cider
cigar
cigarette
cinder
circle
circuit
circular
circulatory
circumference
circus
cirrus
cite

cities
citizen
city
civic
civilization
claim
clan
clap
class
classify
classroom
claw
clay
clean
cleaning
cleanliness
clear
clearer
clearest
clerk
clever
cleverly
cleverness
cliff
climate
climb
climber
climbing
clip
cloak
close
closely
closeness
closer
closet
closing
cloth
clothes
clothing
cloud
cloudburst
clouded
clouding
cloudy
cloverleaf
clown
club
cluck
clump
clumsy
clung
clutch
coach
coaches
coal
coast
coasted
coasting
coat
coax
coaxial
coaxing
cobalt
cockpit
cocoa
coconut
cocoon
code
coffee
coin
cold
cold-blooded
colder
coldest
coliseum
collar
collect
collection
college
colonial
colonies
colony
color
column
comb
combination
combine
come
comedy
comet
comfort
comfortable
comforter
comical
coming
comma
command
comments
commerce
commercial
commit
committed
committee
common

commonwealth
communication
communities
community
commutative
companion
companies
company
compare
comparing
compass
compelled
compete
competition
complain
compose
compound
compound
compression
computation
computer
concave
conceal
concept
concert
conclusions
condemn
condensation
condense
condition
conduct
conduct
conductor
cone
conference
confess
confident
confine
conflict
confuse
confusing
confusion
congratulated
congress
congressmen
congresswomen
connect
connection
conquer
consent
conservation
conserve
consider
consign
consist
console
consonants
constantly
constellation
constitution
construction
contain
container
content
content
contest
contest
contestant
continent
continental
continual
continually
continue
continuous
continuously
contract
contracted
contraction
contrast
contribute
control
convention
conversation
converse
convex
convoy
cook
cookies
cooking
cooky
cool
cooler
coolest
coordination
copper
copied
copies
copy
copying
coral
cord
cordial
corduroy
cork

corn
corner
cornet
correct
corrosion
corsage
cost
costume
cot
cottage
cotton
cotton gin
cotyledon
cough
could
council
counsel
count
counted
counter
counties
counting
country
countryman
countryside
county
couple
courage
courageous
course
court
courteous
courtesy
courthouse
courtship
courtyard
cousin
cover
coverage
covering
cow
coward
cowardice
coy
cozy
crack
cracking
cradle
crafty
cranberries
crash
crashing
crate
crater
crawl
crayon
craze
crazier
crazy
creak
cream
crease
creation
creature
credit
creek
creep
crew
crib
cricket
cried
cries
crime
criminal
crippled
crisp
croak
crocheting
crook
crop
cross
crossing
crow
crowd
crowded
crown
crude
cruel
cruelty
cruise
cruiser
crunch
crush
crust
crustaceans
crutch
cry
crying
crystal
cub
cubes
cuisine
culinary
culture

cumulus
cunning
cup
cupboard
cupful
curb
cure
curious
curl
curly
currants
currency
current
curtain
curve
cushion
custom
customary
customer
cut
cute
cuter
cutest
cutlery
cutting
cycle

cylinder
dad
daddy
daffodil
daily
dairies
dairy
dairymaid
daisy
dam
damage
damp
dance
dancing
dandy
danger
dangerous
dare
daringly
dark
darker
darkest
darkness
darling
darn
dart

darts
dash
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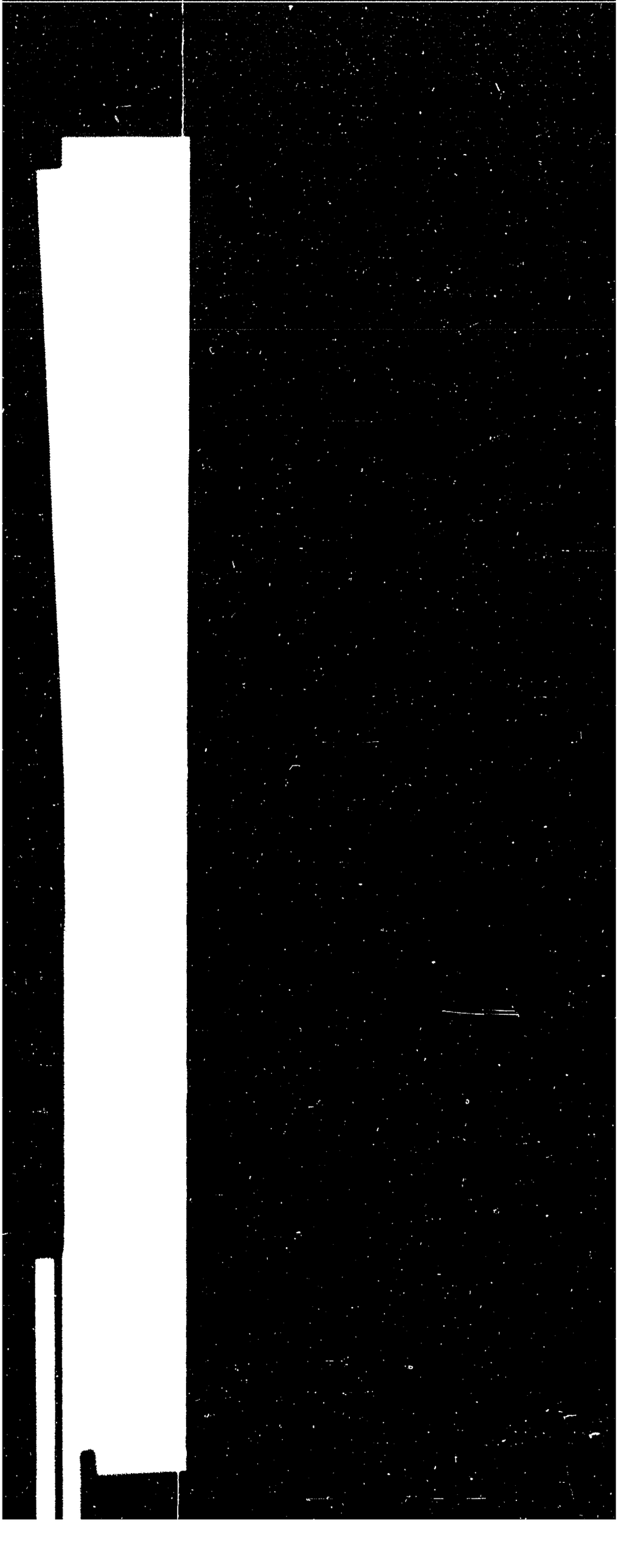

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little	lonely	lower	maid
live	lonesome	loyal	mail
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lively	longer	luckily	main
liver	longest	lucky	mainly
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lizard	look	lumberman	major
load	looking	lump	majority
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loan	loosely	luncheon	making
loaves	looser	lungs	male
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locality	loses	lure	mammals
locate	losing	luring	man
location	loss	lying	manage
lock	lost	macaroni	management
locket	lot	machine	manager
locksmith	lots	machinery	mandible
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lodge	loudly	magazine	manicure
loft	love	magic	manners

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mumps
murder

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newspaper
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nicety
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nickel
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ninety-ninth
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nook

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nor
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northwestern
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numerous
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nursery
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objection
objectives
objector
obligation

oboe
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observatory
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obstacle
obtain
occasion
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occupation
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occur
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odor
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office
officer
official

often
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opponent
opportunities
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opposite
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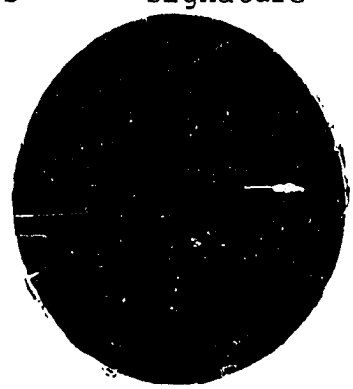

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APPENDIX C

SUMMARY OF APPLICABILITY OF GENERALIZATIONS TO SPELLING PROGRAMS

TABLE 13[a]

SUMMARY OF APPLICABILITY OF GENERALIZATIONS TO SPELLING PROGRAMS

Generalization	Total Number of Words	Number of Words Conforming	Number of Exceptions	Per Cent of Applicability
1. When there are two vowels side by side, the long sound of the first one is heard and the second is usually silent.	1893	612(yeast)[b]	1281(infield)[b]	32
2. When a vowel is in the middle of a one-syllable word, the vowel is short.	942	626	316	66
middle letter	(325)	(240)(chest)	(85)(wrong)	(74)[c]
one of the middle two letters in a word of four letters	(379)	(242)(silk)	(137)(dart)	(64)
one vowel within a word of more than four letters	(238)	(144)(latch)	(94)(burst)	(61)
3. If the only vowel letter is at the end of a word, the letter usually stands for a long sound.	26	20(spy)	6(who)	77
4. When there are two vowels, one of which is final e, the first vowel is long and the e is silent.	418	263(zone)	155(one)	63

TABLE 13--Continued

Generalization	Total Number of Words	Number of Words Conforming	Number of Exceptions	Per Cent of Applicability
5. The r gives the preceding vowel a sound that is neither long nor short.	1507	1301(orbit)	206(ferry)	86
6. The first vowel is usually long and the second silent in the digraphs ai, ea, oa, and ui.	536	309	227	58
ai	(140)	(104)(bait)	(36)(curtain)	(74)
ea	(282)	(150)(steam)	(132)(great)	(53)
oa	(55)	(52)(toast)	(3)(abroad)	(95)
ui	(56)	(3)(nuisance)	(53)(quit)	(5)
7. In the phonogram ie, the i is silent and the e has a long sound.	169	24 (hygiene)	145(tries)	14
8. Words having double e usually have the long e sound.	140	120 (teeth)	20(queer)	86
9. When words end with silent e, the preceding a or i is long.	564	329(admire)	235(welfare)	58

TABLE 13--Continued

	Generalization	Total Number of Words	Number of Words Conforming	Number of Exceptions	Per Cent of Applicability
10.	In ay the y is silent and gives a its long sound.	60	50(display)	10(Kayak)	83
11.	When the letter i is followed by the letters gh, the i usually stands for its long sound and the gh is silent.	59	40(sigh)	19(eight)	68
12.	When a follows w in a word, it usually has the sound a as in was.	67	15(want)	52(reward)	22
13.	When e is followed by w, the vowel sound is the same as represented by oo.	26	11(flew)	15(dew)	42
14.	The two letters ow make the long o sound.	107	58(arrow)	49(plow)	54
15.	W is sometimes a vowel and follows the vowel digraph rule.	159	59(marrow)	100(lawn)	37

TABLE 13--Continued

	Generalization	Total Number of Words	Number of Words Conforming	Number of Exceptions	Per Cent of Applicability
16.	When y is the final letter in a word, it usually has a vowel sound.	529	435(cozy)	76(decay)	86
17.	When y is used as a vowel in words, it sometimes has the sound of long i.	570	55(cycle)	515(gym)	10
18.	The letter a has the same sound (ô) when followed by l, w, and u.	335	116(bald)	219(final)	35
19.	When a is followed by r and final e, we expect to hear the sound heard in care.	28	27(share)	1(are)	96
20.	When c and h are next to each other, they make only one sound.	169	169(torch)	. .	100
21.	Ch is usually pronounced as it is in kitchen, catch, and chair, not like sh.	169	144(merchant)	25(chef)	85
22.	When c is followed by e or i, the sound of s is likely to be heard.	271	232(cease)	39(social)	86

TABLE 13--Continued

	Generalization	Total Number of Words	Number of Words Conforming	Number of Exceptions	Per Cent of Applicability
23.	When the letter c is followed by o or a, the sound of k is likely to be heard.	401	401(vacant)	. .	100
24.	The letter g often has a sound similar to that of j in jump when it precedes the letter i or e.	188	150(age)	38(gift)	80
25.	When ght is seen in a word, gh is silent.	64	64(light)	. .	100
26.	When a word begins kn, the k is silent.	20	20(knee)	. .	100
27.	When a word begins with wr, the w is silent.	20	20(wreck)	. .	100
28.	When two of the same consonants are side by side only one is heard.	699	629(blizzard)	70(nodded)	90
29.	When a word ends in ck, it has the same last sound as in look.	49	49(truck)	. .	100

TABLE 13--Continued

	Generalization	Total Number of Words	Number of Words Conforming	Number of Exceptions	Per Cent of Applicability
30.	In most two-syllable words, the first syllable is accented.	2244	1846(quarter)	398(hello)	82
31.	If a, in, re, ex, de, or be is the first syllable in a word, it is usually unaccented.	347	281(decide)	66(area)	81
32.	In most two-syllable words that end in a consonant followed by y, the first syllable is accented and the last is unaccented.	199	195(candy)	4(deny)	98
33.	One vowel letter in an accented syllable has its short sound.	2943	1693(zoology)	1250(volcano)	68
34.	When y or ey is seen in the last syllable that is not accented, the long sound of e is heard.	431	. .	431(merry)	00

TABLE 13--Continued

	Generalization	Total Number of Words	Number of Words Conforming	Number of Exceptions	Per Cent of Applicability
35.	When ture is the final syllable in a word, it is unaccented.	23	23(venture)	. .	100
36.	When tion is the final syllable in a word it is unaccented.	116	116(election)	. .	100
37.	In many two- and three-syllable words, the final e lengthens the vowel in the last syllable.	437	212(unite)	225(medicine)	49
38.	If the first vowel sound in a word is followed by two consonants, the first syllable usually ends with the first of the two consonants.	1591	1273(fattest)	318(ledger)	80
39.	If the first vowel sound in a word is followed by a single consonant, that consonant usually begins the second syllable.	1301	641(bacon)	660(olive)	49

TABLE 13--Continued

Generalization	Total Number of Words	Number of Words Conforming	Number of Exceptions	Per Cent of Applicability
40. If the first vowel sound in a word is followed by a single consonant, that consonant usually begins the second syllable.	132	127(eagle)	5(tackle)	96
41. When the first vowel element in a word is followed by th, ch, or sh, these symbols are not broken when the word is divided into syllables and may go with either the first or second syllable.	74	74(feathers)	. .	100
42. In a word of more than one syllable, the letter v usually goes with the preceding vowel to form a syllable.	193	132(movies)	61(favor)	68
43. When a word has only one vowel letter, the vowel sound is likely to be short.	840	560(blank)	280(child)	67

TABLE 13--Continued

	Generalization	Total Number of Words	Number of Words Conforming	Number of Exceptions	Per Cent of Applicability
44.	When there is one e in a word that ends in a consonant, the e usually has a short sound.	120	109(zest)	11(germ)	91
45.	When the last syllable is the sound r, it is unaccented.	828	676(under)	152(repair)	82

[a]This table presents the composite findings for each of the forty-five recommended phonic generalizations. The number order of the generalizations in this table is identical with that in the tables shown in the Clymer and Bailey studies.

[b]Words in parentheses are examples of words that conform or of exceptions.

[c]Figures in parentheses indicate specific applications of the generalization.

APPENDIX D

COMPARISON OF APPLICABILITY OF PHONIC GENERALIZATIONS TO SPELLING AND READING PROGRAMS

TABLE 14

COMPARISON OF APPLICABILITY OF PHONIC GENERALIZATIONS TO SPELLING AND READING PROGRAMS[a]

Generalization	Applicability		
	Per Cent of Applicability		
	Primary Readers (Clymer)	Primary and Intermediate Readers (Bailey)	Elementary School Spelling Programs
1. When there are two vowels side by side, the long sound of the first one is heard and the second is usually silent.	45	34	32
2. When a vowel is in the middle of a one-syllable word, the vowel is short.	62	71	66
middle letter	(69)	(78)	(74)[b]
one of the middle two letters in a word of four letters	(59)	(68)	(64)
one vowel <u>within</u> a word of more than four letters	(46)	(62)	(61)

TABLE 14--Continued

Generalization	Applicability		
	Per Cent of Applicability		
	Primary Readers (Clymer)	Primary and Intermediate Readers (Bailey)	Elementary School Spelling Programs
3. If the only vowel letter is at the end of a word, the letter usually stands for a long sound.	74	76	77
4. When there are two vowels, one of which is final e, the first vowel is long and the e is silent.	63	57	63
5. The r gives the preceding vowel a sound that is neither long nor short.	78	86	86
6. The first vowel is usually long and the second silent in the digraphs ai, ea, oa, and ui.	66	60	58
ai	(64)	(72)	(74)
ea	(66)	(55)	(53)
oa	(97)	(95)	(95)
ui	(6)	(10)	(5)

TABLE 14--Continued

Generalization	Applicability		
	Per Cent of Applicability		
	Primary Readers (Clymer)	Primary and Intermediate Readers (Bailey)	Elementary School Spelling Programs
7. In the phonogram ie, the i is silent and the e has a long sound.	17	31	14
8. Words having double e usually have the long e sound.	98	87	86
9. When words end with silent e, the preceding a or i is long.	60	50	58
10. In ay the y is silent and gives a its long sound.	78	88	83
11. When the letter i is followed by the letters gh, the i usually stands for its long sound and the gh is silent.	71	71	68
12. When a follows w in a word, it usually has the sound of a as in was.	32	22	22

TABLE 14--Continued

Generalization	Applicability		
	Per Cent of Applicability		
	Primary Readers (Clymer)	Primary and Intermediate Readers (Bailey)	Elementary School Spelling Programs
13. When e is followed by w, the vowel sound is the same as represented by oo.	35	40	42
14. The two letters ow make the long o sound.	59	55	54
15. W is sometimes a vowel and follows the vowel digraph rule.	40	33	37
16. When y is the final letter in a word, it usually has a vowel sound.	84	89	86
17. When y is used as a vowel in words, it sometimes has the sound of long i.	15	11	10

TABLE 14--Continued

Generalization	Applicability		
	Per Cent of Applicability		
	Primary Readers (Clymer)	Primary and Intermediate Readers (Bailey)	Elementary School Spelling Programs
18. The letter a has the same sound (ô) when followed by l, w, and u.	48	34	35
19. When a is followed by r and final e, we expect to hear the sound heard in care.	90	96	96
20. When c and h are next to each other, they make only one sound.	100	100	100
21. Ch is usually pronounced as it is in kitchen, catch, and chair, not like sh.	95	87	85
22. When c is followed by e or i, the sound s is likely to be heard.	96	92	86

TABLE 14--Continued

Generalization	Applicability		
	Per Cent of Applicability		
	Primary Readers (Clymer)	Primary and Intermediate Readers (Bailey)	Elementary School Spelling Programs
23. When the letter c is followed by o or a, the sound of k is likely to be heard.	100	100	100
24. The letter g often has a sound similar to that of j in jump when it precedes the letters i or e.	64	78	80
25. When ght is seen in a word, gh is silent.	100	100	100
26. When a word begins kn, the k is silent.	100	100	100
27. When a word begins with wr, the w is silent.	100	100	100
28. When two of the same consonants are side by side, only one is heard.	99	98	90

TABLE 14--Continued

Generalization	Applicability		
	Per Cent of Applicability		
	Primary Readers (Clymer)	Primary and Intermediate Readers (Bailey)	Elementary School Spelling Programs
29. When a word ends in ck, it has the same last sound as in look.	100	100	100
30. In most two-syllable words, the first syllable is accented.	85	81	82
31. If a, in, re, de, ex, or be, is the first syllable in a word, it is usually unaccented.	87	84	81
32. In most two-syllable words that end in a consonant followed by y, the first syllable is accented and the last is unaccented.	96	97	99
33. One vowel letter in an accented syllable has its short sound.	61	65	68

TABLE 14--Continued

Generalization	Applicability		
	Per Cent of Applicability		
	Primary Readers (Clymer)	Primary and Intermediate Readers (Bailey)	Elementary School Spelling Programs
34. When y or ey is seen in the last syllable that is not accented, the long sound of e is heard.	. .	. .	. .
35. When ture is the final syllable in a word, it is unaccented.	100	95	100
36. When tion is the final syllable in a word, it is unaccented.	100	100	100
37. In many two- and three-syllable words, the final e lengthens the vowel in the last syllable.	46	46	49
38. If the first vowel sound in a word is followed by two consonants, the first syllable usually ends with the first of the two consonants.	72	78	80

TABLE 14--Continued

Generalization	Applicability		
	Per Cent of Applicability		
	Primary Readers (Clymer)	Primary and Intermediate Readers (Bailey)	Elementary School Spelling Programs
39. If the first vowel sound in a word is followed by a single consonant, that consonant usually begins the second syllable.	44	50	49
40. If the last syllable of a word ends in le, the consonant preceding the le usually begins the last syllable.	97	93	96
41. When the first vowel element in a word is followed by th, ch, or sh, these symbols are not broken when the word is divided into syllables and may go with either the first or second syllable.	100	100	100

TABLE 14--Continued

Generalization	Applicability		
	Per Cent of Applicability		
	Primary Readers (Clymer)	Primary and Intermediate Readers (Bailey)	Elementary School Spelling Programs
42. In a word of more than one syllable, the letter v usually goes with the preceding vowel to form a syllable.	73	65	68
43. When a word has only one vowel letter, the vowel sound is likely to be short.	57	69	67
44. When there is one e in a word that ends in a consonant, the e usually has a short sound.	76	92	91
45. When the last syllable is the sound r, it is unaccented.	95	79	82

[a]This table presents a comparison of the forty-five phonic generalizations.

[b]Figures in parentheses indicate specific applications of the generalizations.

APPENDIX E

CORRESPONDENCE

Niemann Apt. A-17
Norman, Oklahoma
April 30, 1968

Dr. Theodore W. Clymer
Professor, College of Education
University of Minnesota
Minneapolis 14, Minnesota

Dear Sir:

During the coming months I plan to study the tentative topic, The Commonness and Applicability of Phonic Generalizations In Selected Spelling Programs, for a doctoral dissertation. This project will be developed with the approval and advice of Dr. Mary Clare Petty and Dr. Robert Curry of the Graduate College of Education, University of Oklahoma.

Certainly your excellent study of "The Utility of Phonic Generalizations in the Primary Grades" would be highly significant to my study. This letter is written to ask your permission to use your list of forty-five phonic generalizations, to utilize your technique for determining "per cent of utility" of the generalizations, and to quote from your published report. If your permission is granted, all your materials and quotes will be properly documented and credited to you. An abstract of the prospectus for my study, or of the final report will be furnished you upon your request.

Your cooperation will be appreciated. To facilitate your reply, a self-addressed stamped envelope is included.

Yours truly,

Lillie S. Davis
Graduate Student

/lsd

Niemann Apt. A-17
Norman, Oklahoma
April 30, 1968

Dr. Mildred Hart Bailey, Director
The Reading Clinic
Northwestern State College
Natchitoches, Louisiana

Dear Dr. Bailey:

During the coming months I plan to study the tentative topic, The Commonness and Applicability of Phonic Generalizations In Selected Spelling Programs, for a doctoral dissertation. This project will be developed with the approval and advice of Dr. Mary Clare Petty and Dr. Robert Curry of the Graduate College of Education, University of Oklahoma.

Certainly, your excellent study of "The Utility of Phonic Generalizations in Grades One Through Six," would be highly significant to my study. This letter is written to ask your permission to quote from your published report, including the table, "The Utility of Generalizations in Grades One Through Six." If your permission is granted, all your materials and quotes will be properly documented and credited to you. An abstract of the prospectus for my study or of the final report will be furnished you upon your request.

Your cooperation will be appreciated. To facilitate your reply, a self-addressed stamped envelope is enclosed.

Yours truly,

Lillie S. Davis
Graduate Student

/lsd

Niemann Apartment A-17
Norman, Oklahoma
May 1, 1968

_____ Publishing Company
_____
_____

Dear Sirs:

I am planning to develop a doctoral study concerned with phonetic content introduced in comprehensive series of spellers. Your series _____ by _____, _____ edition, is not available to me. Will you please send me a detailed description of this series (prospectus, promotional materials, etc.)?

This information will serve to develop a list of series for more extensive study from which will be selected the texts for final analysis in the study.

If your series is selected, I shall contact you again and request your permission to include your series in the study.

Thank you kindly for an early reply.

Yours truly,

Lillie S. Davis
Graduate Student

Approved:

Mary Clare Petty
Professor of Education
University of Oklahoma

NORTHWESTERN STATE COLLEGE OF LOUISIANA

Natchitoches, Louisiana 71457

May 2, 1968

Mrs. Lillie S. Davis
Niemann Apartment A-17
Norman, Oklahoma 73069

Dear Mrs. Davis:

In reference to your letter of April 30, 1968, please be advised that you have my permission to quote from my doctoral dissertation entitled "An Analytical Study of the Utility of Selected Phonic Generalizations for Children in Grades One Through Six," and from my article entitled "The Utility of Phonic Generalizations in Grades One Through Six," published in the February, 1967, Reading Teacher. However, you must obtain permission from the International Reading Association, also, to quote from the latter source.

Good luck on your study.

Sincerely,

Mildred H. Bailey
Associate Professor and
Director, The Reading Clinic

MHB:ld

THEODORE CLYMER
P. O. Box 3708 971 Winther Way
Santa Barbara, California 93105

May 6, 1968

Mrs. Lillie S. Davis
Niemann Apartment A-17
Norman, Oklahoma 73069

Dear Mrs. Davis:

I have your letter of April 30th which was forwarded to me from the University of Minnesota. I am now in California on leave from the University of Minnesota.

I am, of course, pleased to learn that you intend to extend my study to make applications to the generalizations in selected spelling programs. You have my permission to utilize my list of 45 phonic generalizations, to utilize my technique for determining "per cent of utility" and to quote from my published report in your thesis.

I am sending a copy of this letter, as well as a photocopy of your letter to Mrs. Faye Branca who is publications coordinator for the International Reading Association. As the research report was published in an IRA publication, the Association must also grant you permission to quote from my published report. I can assure you that there will be no problem or charge for your use of the material from the IRA report. The procedures are just a matter of formality. I do not believe it will be necessary for you to correspond at all with Mrs. Branca at this time. If she wishes you to give her any information, I am certain that she will write to you.

Good luck to you in your research. I would be very pleased to have a report of it when you have it completed.

Sincerely,

Theodore Clymer

S

cc: Mrs. Faye Branca
Publications Coordinator, IRA

INTERNATIONAL READING ASSOCIATION
An Incorporated Non-Profit Professional Organization

Tyre Ave. at Main Street
Newark, Delaware 19711

May 8, 1968

Mrs. Lillie S. Davis
Niemann Apartment A-17
Norman, Oklahoma 73069

Dear Mrs. Davis:

Dr. Theodore Clymer has referred your request of April 30, 1968, to this office.

The Association is happy to grant permission for you to use in your doctoral dissertation Dr. Clymer's forty-five phonic generalizations and to quote from his article "The Utility of Phonic Generalizations in the Primary Grades," which appeared in the January 1963 issue of The Reading Teacher, pp. 252-260.

We wish you success with your study.

Sincerely yours,

Mrs. Faye R. Branca
Publications Coordinator

FRB/rm
cc Dr. Clymer

INTERNATIONAL READING ASSOCIATION
An Incorporated Non-Profit Professional Organization

Tyre Avenue at Main Street
Newark, Delaware 19711

May 17, 1968

Mrs. Lillie S. Davis
Niemann Apartments A-17
Norman, Oklahoma 73069

Dear Mrs. Davis:

Thank you for sending us a copy of Dr. Bailey's letter granting you permission to use her article, "The Utility of Phonic Generalizations in Grades One through Six," which appeared in the February 1967 issue of THE READING TEACHER.

You have the Association's permission to use this material in your doctoral dissertation, "The Commonness and Applicability of Phonic Generalizations in Selected Spelling Programs."

Cordially,

(Mrs.) Elaine A. Fraze
Permissions

cc: Dr. Mildred H. Bailey

May 23, 1968

Permissions Department
_____
_____
_____

Dear Sir:

I plan to develop a doctoral dissertation on the applicability of phonic generalizations in selected spelling programs. Your spelling series, _____, by _____ _____, has been selected for analysis in the study.

This letter is written to ask your permission to utilize the spelling words in the textbooks for grades two through six to test phonic generalizations.

Doctors Theodore Clymer and Mildred H. Bailey have already tested these generalizations against a composite list of words taken from several different basal reading series, and I plan to extend their studies to include the vocabulary of selected spelling series. Their permission to make this study has been granted.

Your spelling program will be properly identified in the dissertation copy. To facilitate your reply, a self-addressed stamped envelope is enclosed. Thank you for your cooperation.

Yours truly,

Lillie S. Davis
Graduate Student

Approved:

Mary Clare Petty
Professor of Education

THE ECONOMY COMPANY

Educational Publishers

OKLAHOMA CITY, OKLAHOMA

May 24, 1968

Mrs. Lillie S. Davis
Nieman Apartments, Apartment A-17
Norman, Oklahoma 73069

Dear Mrs. Davis:

Thank you very much for your letter of May 23 requesting permission to use the spelling words in our spelling growth program to test phonetic generalizations.

We are glad to grant you permission for your work, and if possible, we would appreciate a copy of your dissertation for our reference library.

Sincerely,

Ford C. Price
Executive Vice President

FCP/mjm

FOLLETT PUBLISHING COMPANY
1010 West Washington Boulevard
Chicago, Illinois 60607

June 3, 1968

Mrs. Lillie S. Davis
Nieman Apt. A-17
Norman, Oklahoma

Dear Mrs. Davis:

We are pleased to grant your request to use SPELLING AND WRITING PATTERNS by Morton Botel, et al., in your doctoral disseration as outlined in your letter of May 23, 1968, providing that you give credit to title, authors, publisher, and copyright date on the page or pages where used, and providing the dissertation is not published.

Our editor has also reviewed your request, and for your information I quote from her note to us:

> "However, it must be clearly stated that although a study has been made of this word list, the program itself does not use phonics generalizations commonly used in other programs in spelling. Instead, we use a linguistic approach, grouping words in patterned sets and whatever generalizations are made on a language level apply only to the particular word set under study."

Best wishes and success on your project.

Cordially,

FOLLETT EDUCATIONAL CORPORATION

Alice Anne Foley
Permissions Department

SILVER BURDETT COMPANY A Division of General Learning Corporation

June 13, 1968

Mrs. Lillie S. Davis
Niemann Apartment A-17
Norman, Oklahoma 73069

Dear Mrs. Davis:

In response to your request, forwarded by our Dallas office, we are pleased to give you permission to utilize the spelling words in Spell Correctly, Grades 2 through 6, for analysis in a study testing phonic generalizations, for inclusion in your doctoral dissertation on the applicability of phonic generalizations in selected spelling programs.

We require the following acknowledgment in footnote form on each page of the study and dissertation containing our material, and if possible, a copy of the study for our permissions file.

> From Spell Correctly, Grade ___, c 1968 General Learning Corporation. Used by permission of Silver Burdett Company.

The permission granted in this letter is for use of the spelling words as specified above only and is based upon your compliance with our required form of credit. If you wish to use the material for another purpose at another time, it will be necessary for you to request permission again.

We are happy to be of service to you and if we may be of further assistance, please do not hesitate to contact me.

Sincerely yours,

(Mrs.) Pauline Coburn
Rights and Permissions

/c

J. B. LIPPINCOTT COMPANY

June 20, 1968

Mrs. Lillie S. Davis
Niemann Apt. A-17
Norman, Oklahoma

Dear Mrs. Davis:

Thank you for your letter of June 18 telling us of your forthcoming doctoral dissertation on the applicability of phonic generalizations in selected spelling programs.

We are happy to grant you permission to use the spelling words from our BASIC SPELLING KEYS textbooks for the grades 2-6.

We would appreciate receiving a copy of your dissertation when the study is completed.

Sincerely yours,

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Permissions Department
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June 25, 1968

Mrs. Lillie S. Davis
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Norman, Oklahoma 73969

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July 11, 1968

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Best wishes for the successful completion of your dissertation.

Sincerely yours,

(Mrs.) Helen H. O'Neill
Elementary Language Arts
Department